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ABSTRACT

Training modules are presented for speech-language pathologists developing communication programming for Kentucky students with severe, profound, and multiple handicaps. The modules were developed for use in 2-day workshops that specifically deal with communication strategies to enhance opportunities for increased participation and integration for these students in home, school, and community settings. The document begins with an introduction describing the training workshop design and a discussion of workshop goals and philosophies. The modules cover assessment of communicative functions, identification of communicative intent of aberrant behaviors, strategies for expanding students' communicative repertoire, incidental language instruction and techniques for promoting communication in natural contexts, provision of instruction in integrated school and community settings, development of augmentative systems, the use of switch interfaces, and consultation with classroom teachers and parents. Appendixes contain: workshop agenda; workshop evaluation forms; plan of action form for implementation of workshop strategies for a selected student; observational assessment and intervention planning form; case studies; sources for equipment and materials; a list of related agencies and resources; a list of professional organizations; and a list of state documents and related training projects. (JDD)

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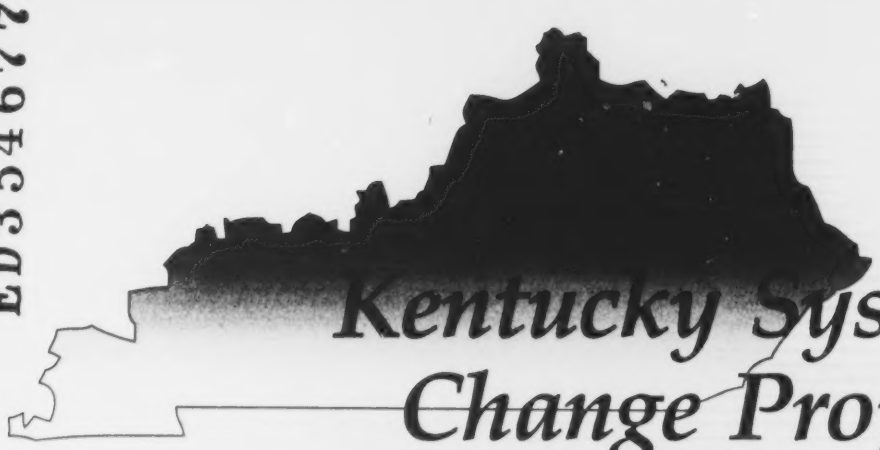

Kentucky Systems Change Project

Communication Programming for Students with Severe and Multiple Handicaps

Pamela D. Smith, Ed.D.
Jane O'Regan Kleinert, M.S.P.A., C.C.C.
Editors
1989

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Additional materials are available from the Kentucky Systems Change Project for Students with Severe Handicaps for the cost of printing and mailing. To order, send a check or purchase order to the address above or call (606) 257-1714.

New ☞ ***Services for Children with Special Health Care Needs: Guidelines for Local School Districts*** (Smith, P. D. & Leatherby, J. L., 1991) - A manual developed for local school districts to provide guidelines on developing and implementing services for students with special or complex health care needs. The manual includes training forms and forms for documenting provision of various health care services. Approximately 120 pages, $8.00.

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Quality Program Indicators Manual for Students with Moderate and Severe Handicaps (Kleinert, H., Smith, P. & Hudson, M., 1990) - An assessment instrument used to conduct program evaluations in classrooms serving students with moderate and severe handicaps. The manual is organized around six areas of quality programming, (1) integration, (2) functional curriculum, (3) systematic instruction, (4) community-based instruction, (5) transdisciplinary services and integrated therapy, and (6) vocational instruction and transition plans. 92 pages, $5.00.

Curriculum Process and Model Local Catalogs for Students with Moderate and Severe Handicaps (Hudson, M. & Kleinert, H., 1991) - A comprehensive curriculum based on the local catalog process for selecting age-appropriate activities for students with moderate and severe handicaps. The curriculum has an elementary section and a section appropriate for middle school and high school-aged students. The curriculum also includes chapters describing how to adapt curriculum to meet the needs of students with severe and multiple handicaps and how to select priority activities for inclusion on the IEP. Sample instructional objectives from the four domains are included in the manual and on software compatible with Apple IIe/Apple II gs and IBM (MS DOS) computers to facilitate computer-generated IEPs. 160 page manual and software program set, $12.00.

Communication Manual for Students with Severe and Multiple Handicaps (Smith, P. & Kleinert, J., 1991) - A comprehensive manual written for speech/language pathologists and other professionals who work with students with severe and multiple handicaps that focuses on the development and implementation of communication programs. The manual was developed and used for statewide inservice training for speech/language pathologists in Kentucky. 275 pages, $18.00.

Integrating Related Services into Programs for Students with Severe and Multiple Handicaps (Smith, P., 1990) - A manual developed for administrators, teachers, therapists, and parents that includes administrative and implementation issues and strategies for integrating related services. 60 pages, $4.00.

Make checks payable to the **Interdisciplinary Human Development Institute**.

COMMUNICATION PROGRAMMING FOR STUDENTS WITH SEVERE AND MULTIPLE HANDICAPS

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INTRODUCTION

AND

TRAINING DESIGN

Pamela D. Smith, Ed.D.

INTRODUCTION AND TRAINING DESIGN

Pamela D. Smith, Ed.D

In October 1987, the United States Office of Special Education Programs funded a five year Kentucky Department of Education, Office of Education for Exceptional Children project to develop and improve the quality of integrated educational programs for children and youth with severe handicaps statewide. That project is housed at the University of Kentucky Interdisciplinary Human Development Institute - University Affiliated Program and entitled the Kentucky Systems Change Project for Students with Severe Handicaps. As part of its activities, the project has been working directly with selected local school districts to provide technical assistance to develop and implement exemplary programs in regular schools for students with severe handicaps.

Comprehensive district needs assessments and on site follow-up visits to participating classrooms by the Kentucky Systems Change Project staff indicated a critical need across districts to address communication programming for students with severe and multiple handicaps. Speech-language pathologists have often received little training in appropriate programming for these students. In many cases, communication systems for these students were nonexistent. Further, data from a major follow-up study of teachers of students with moderate and severe handicaps indicate that teachers rate the lack of appropriate communication programming for students as a significant barrier in implementing community-based programs (Nelson, 1988).

As a part of the Kentucky Systems Change Project training and technical assistance efforts, training modules were developed for speech-language pathologists on communication programming for students with severe, profound, and multiple handicaps. The modules were used in a series of two-day workshops that specifically dealt with communication strategies to enhance opportunities for increased participation and integration for these students in home, school, and community settings. An administrator session was conducted in conjunction with each workshop to assist in developing administrative support at the local district level. This manual contains the modules developed for and used in the training. Participant activities, materials, resources, and media referred to in this text are those that were used in the workshops.

WORKSHOP SITES AND PARTICIPANTS

The two-day workshop was conducted in five different regions in Kentucky during the 1988 - 1989 school year. The workshops were hosted by five school districts participating in the Kentucky Systems Change Project: Christian County, Johnson County, Somerset Independent, Kenton County, and Bullitt County school systems. These districts were chosen because each had significant numbers of students with severe handicaps and/or they are located in strategic geographical areas of the state.

A total of 98 speech-language pathologists and 35 administrators completed the training. Table 1 contains the number of speech-language pathologists and administrators trained across the five workshops and the school districts they represented.

Responsibilities of Host Sites

The special education coordinator for the five host sites was contacted prior to scheduling each workshop to clear target dates and to obtain information on lodging and travel directions. Host sites were responsible for providing media equipment and assisting with workshop activities. Each special education coordinator was sent media release forms to be signed by the parents of students targeted for video taping for the workshop. The day prior to each workshop, classrooms in the host district were visited to provide consultation and to obtain these video taped segments to use in the workshop. At least one speech-language pathologist with each district assisted in coordinating this activity.

Applicants were screened using a two-step process. Initial written application forms were distributed to districts for their speech-language pathologists. The application form included questions about the number of students with severe and multiple handicaps presently receiving speech-language services and current communication goals for these students. Follow-up telephone interviews with applicants were used to confirm this information. First priority for selection was given to speech-language pathologists serving students with severe and multiple handicaps from districts in the Kentucky Systems Change Project. Additional spaces in each workshop (up to maximum of 20) were assigned on a first come basis to speech-language pathologists from other school districts in the same geographical area who met the eligibility criteria.

WORKSHOP CONTENT AND FOLLOW-UP ACTIVITIES

Workshop sessions concentrated on assessment of communicative functions, identification of communicative intent of aberrant behaviors, strategies for expanding students' communicative repertoire, incidental language instruction and techniques for promoting communication in natural contexts, provision of instruction in integrated school and community settings, development of augmentative systems, and consultation with classroom teachers and parents. Instruction was provided with an emphasis upon training of functional skills in natural settings, use of a consultation model for service delivery, and video taped demonstrations for workshop participants to promote group participation and problem solving. The agenda for the two-day workshop is contained in Appendix A.

Table 1

Number of Workshop Participants by Districts

Workshop	#	Districts Represented
1. Somerset, KY	21	Somerset Independent**, Fayette Co., Clark Co.*; Whitley, Lincoln, Boyle, Clay, Garrad, Pulaski & Wayne Counties
Administrators	5	Somerset Independent**, Fayette Co. *; Garrard Co., Upper Cumberland Educational Cooperative
2. Paintsville, KY	16	Johnson Co.**, Jenkins Independent *; Floyd, Leslie, Knott, Magoffin, Powell, Rowan & Breathitt Counties
Administrators	7	Johnson Co.**, Jenkins Indenpendent *; Knott & Magoffin Counties
3. Ft. Mitchell, KY	27	Kenton Co.**, Carroll Co., Boone Co., Covington Independent *; Erlanger-Elsmere, Newport, Dayton & Paris Independent; Scott, Anderson, Jessamine, Robertson & Trimble Counties; Northern Kentucky Easter Seals
Administrators	12	Kenton Co.**, Carroll Co. Boone Co., Covington Independent *; Erlanger-Elsmere Independent; Anderson, Jessamine, Grant &Trimble Counties; Northern Kentucky Educational Cooperative; Northern Kentucky Easter Seals
4. Shepherdsville, KY	19	Bullitt Co.**, Elizabethtown Independent*; Jefferson, Madison & Marion Counties; Jefferson Co. Easter Seals
Administrators	9	Bullitt Co.**, Elizabethtown Independent *; Jefferson Co.; Jefferson Co. Easter Seals
5. Hopkinsville, KY	15	Christian Co.**, Warren Co., Paducah Independent *; Hopkins, Caldwell, Calloway, Marshall & Henderson Counties
Administrators	2	Warren Co. & Paducah Independent *

Note: * Districts participating in the Kentucky Systems Change Project
** Districts acting as "host" district and participating in the Kentucky Systems Change Project.

Each participant was required to develop a "plan of action" for one student with severe handicaps that he/she serves. This plan of action included assessment and intervention strategies for implementation across home, school, and community settings. Members of the workshop training team reviewed these and provided feedback and recommendations to each of the participants prior to the conclusion of the training. The "Plan of Action" format is contained in Appendix B.

In addition, each speech-language pathologist participated in a small group activity and made their own switch interface for use with battery operated and electronic devices. Speech-language pathologists in participating Systems Change districts agreed to have these materials and programs in place at the time of the onsite follow -up.

The costs of lodging, meals, and travel was covered by the Kentucky Systems Change Project for all participants. With the strategic geographical selection of workshop sites, few participants required overnight lodging and car pooling was encouraged. No registration fee was required for the workshop. The workshop was approved for 1.5 CEU's by the Kentucky Board of Speech-Language Pathology and Audiology to encourage attendance.

Administrator Training Session

A separate administrator training session was held in conjunction with each of the five workshops. The purpose of the administrator session was to develop local support for the strategies and changes in service provision presented to the speech-language pathologists in the workshop. The content was designed for special education coordinators and principals who work with pathologists selected for inclusion in the workshop. The administrator session included information about the role of the speech-language pathologist in the provision of appropriate speech-language services for children and youth with severe and multiple handicaps. An overview of the training content was presented, along with demonstration of selected strategies and augmentative communication devices. A major portion of the session focused on service delivery and state guidelines for speech services with special emphasis on meeting the communication needs of students with severe and multiple handicaps. Special education coordinators were able to view many of the resources and materials that were recommended during the training to their therapists and were encouraged to purchase these for use by speech-language pathologist in their district. The agenda for the administrator session is contained in Appendix A.

Follow-up Activities for Systems Change Districts

At least one day of onsite follow-up was provided to speech-language pathologists serving students with severe handicaps in each of the districts participating in the Kentucky Systems Change Project. The workshop coordinator or another speech-language pathologist who was experienced in working with students with severe and multiple handicaps and familiar with the training content provided consultation to

assist speech-language pathologists in implementing, evaluating, and revising their communication programs for targeted students. This person was accompanied by a staff member of the Kentucky Systems Change Project.

DEVELOPMENT OF TRAINING MANUAL

All participants received a workshop manual that included the training modules contained in this manual, related handouts, plans for homemade materials/devices, references and resource lists, and recommended readings. Overall training content and agenda were designed by the training team. Individual training modules were written by team members in their areas of expertise. Each section of this manual contains a training module, references of interest, and suggested handouts to accompany module content.

These modules were revised and expanded for inclusion in this manual. The appendices contain additional information, forms, and resources that were provided to the participants during the training. The appendices and their contents are as follows:

Appendix A: Agenda & Evaluation Forms - agenda for both the two-day workshop for speech-language pathologists and the administrator training session, evaluation forms, the Pre- and Posttest taken by the speech-language pathologist, Speech-language Pathologist Survey.

Appendix B: "Plan of Action" form (process completed by workshop participants to describe "action plan" for implementation of workshop concepts and strategies for a selected student with severe or multiple handicaps on his/her caseload).

Appendix C: Observational Assessment & Intervention Planning Form (observation/information gathering forms to be used by speech-language pathologists when assessing students with severe and multiple handicaps to plan intervention strategies).

Appendix D: Case Studies (selected case studies of children and youth with severe and multiple handicaps for participants future reference).

Appendix E: Sources for Equipment and Materials - names, addresses, and telephone numbers of companies to purchase all equipment, materials, and resource manuals described/referenced in the training modules.

Appendix F: Related Agencies & Resources - names, addresses, and telephone numbers of selected state, regional, and national resources for communication programming and related services for persons with severe handicaps.

Appendix G: Professional Organizations - names, addresses, and telephone numbers of related professional organizations (includes list of professional journals and newsletters available).

Appendix H: State Documents & Related Training Projects - descriptions of related state documents and training available, and how to obtain these.

EVALUATION PROCEDURES AND RESULTS

Evaluation procedures used during the training for speech-language pathologists consisted of a) pre- and posttests, b) survey on attitudes, and c) workshop evaluation forms for both days of training.

Pre- and Posttest Results

The results of the pre- and posttests for each workshop are contained in Table 2. The mean pretest score across the five workshops was 18 (100 points possible) indicating that the participants entered the training with very little knowledge of strategies to meet the communication needs of students with severe and multiple handicaps. The range for pretest scores was 0 to 63. The mean posttest score was 61.6 indicating that participants made an average gain of 42.6 points upon the completion of the two-day training. The range for posttest scores was 24 to 95. A copy of the pre-/posttest is contained in Appendix A.

Table 2

Pre- & Posttest Results for Participating Speech-Language Pathologists

			Pretest		Posttest		Gains
			Range	Mean	Range	Mean	
1.	Somerset	(N = 21)	10 - 49	16	34 - 80	63	47
2.	Paintsville	(N = 16)	0 - 27	9	39 - 79	57	48
3.	Ft. Mitchell	(N = 27)	0 - 45	16	25 - 85	51	35
4.	Shepherdsville	(N = 19)	4 - 49	22	24 - 87	54	32
5.	Hopkinsville	(N = 15)	0 - 63	27	54 - 95	78	51
	Overall		**0 - 63**	**18**	**24 - 95**	**61.6**	**42.6**

Speech-Language Pathologist Survey

Each speech-language pathologist completed a survey at the beginning of the workshop. A copy of the survey is contained in Appendix A. The survey focuses on the workshop philosophies contained in the succeeding section of this manual. The survey items incorporate "best practices" such as integration, transdisciplinary teaming and integrated therapy, parent participation, group instruction, community-based instruction, age-appropriate functional activities, and instruction in natural settings. The purpose of the survey was for participants to conduct a self-assessment of their attitudes towards communication programming for students with severe and multiple handicaps.

WORKSHOP EVALUATION

Workshop evaluations were completed by all participants in both the workshop for speech-language pathologists and the administrator session. These evaluations served as feedback to the trainers in revising workshop content and participant activities. A summary of the evaluation results for both the speech-language pathologists and the administrators are contained in Appendix A.

Reference

Nelson, J. (1988). An analysis of transfer of training in Project SPLASH (an inservice program for special education teachers in Kentucky). Unpublished Doctoral Dissertation, Vanderbilt University, Nashville.

WORKSHOP GOALS
AND
PHILOSOPHIES

Jane O'Regan Kleinert, M.S.P.A., C.C.C.

WORKSHOP GOALS AND PHILOSOPHIES

Jane O'Regan Kleinert, M.S.P.A., C.C.C.

I. WORKSHOP GOALS

The major goals of this workshop are to:

A. View students having multiple and severe handicaps in a way that emphasizes abilities and not disabilities.

B. Conduct assessments and provide intervention using age-appropriate, functional activities that provide for natural antecedents and consequences across multiple environments.

C. Recognize communication attempts which are evidenced in a non-standard way.

D. Develop strategies which increase the student's social interactions in a variety of settings (e.g., peer groups, home, school, community, etc.) and across major life domains (community, domestic, recreation/leisure, and vocational).

E. Become aware of the variety of innovative strategies and systems available to increase communication in students with severe handicaps.

F. Be involved in evaluation simulations and communication system development for students with severe handicaps.

G. Become an active part of a transdisciplinary team.

H. Develop communication skills within students that will facilitate participation in integrated home, school, and community settings.

II. WORKSHOP PHILOSOPHIES

The following workshop philosophies reflect major state-wide initiatives in programs for students with severe handicaps. These philosophies are consistent with the Kentucky Office of Education for Exceptional Children's SPLASH (Strategies for Programming Longitudinally for All Severely

Handicapped) and SHIPP (Severely Handicapped Integrated Preschool Programming) inservice training projects (See Appendix H). Moreover, these philosophies are directly related to the Kentucky Non-Diploma Program of Studies for Students with Moderate and Severe Handicaps.

A. General

1. Communication is a basic right and need of all individuals.

2. Communication at some level is possible and identifiable for all students regardless of functioning "level".

3. Every step toward improved communication, attending and interaction with others and the environment, no matter how small, leads to some increased quality of life and "independence" for a student, regardless of his/her disability.

4. Communication programming goals should enhance students' opportunities for increased integration and interactions with non-handicapped peers and the community in general.

5. Even students with profound handicaps can gain from the presence of their nonhandicapped peers (via contagion, alertness/awareness activities, etc.) and such is their basic human right to integration.

B. Assessment

1. There are a variety of domains/environments in which communication may occur, including: domestic, recreation/leisure, school, community, and vocational. Observation of students in such environments must be included in any assessment/evaluation effort.

2. Close observational assessment of any form or degree of communication output is necessary in conjunction with whatever form of "standardized" assessment tool is used.

3. Physical and sensory disabilities often mask communication attempts.

4. "Aberrant behavior" can frequently be a communication attempt.

C. Treatment

1. Students should be encouraged to think of themselves as independent, capable individuals. The objective of communication programming is to help students learn to make choices, initiate and maintain contact with other individuals, and share information and interactions.

2. Families (i.e., parents, siblings, caregivers) are often the most accurate reporters of a student's communication abilities and they must have major input regarding that student's communication programs.

3. Communication goals and intervention strategies should be student based and not therapist/teacher based.

4. Communication skills must occur and be taught in the natural environment so that:
   a. there is a reason to communicate
   b. natural reinforcers are present
   c. carryover and generalizations are immediate.

5. Communication programs must be functional at any and all stages of development.

6. Selection of appropriate activities, natural settings, goals and strategies for communication programming should reflect the student's cultural, family, academic, and social needs and should be identified via:
   a. appropriate behavior sampling techniques
   b. "cataloging" approach involving information from family and teachers
   c. direct observation in natural settings.

7. Speech/language goals should be infused into ongoing daily activities so that the student practices skills throughout the day, and not simply in a "therapy" session.

8. All communication programs should provide recommendations for integration of goals into ongoing functional activities so that the student develops interactive communication with the people in his/her natural environment (home, school, community).

D. Augmentative Systems

1. A communication system, if at all possible, should be interpretable by the general community, rather than just by a few persons in the student's immediate environment.

2. Individual persons may use multiple modes of communication if necessary (e.g., vocalization plus sign plus a communication board or natural gestures, etc.).

3. Development of a communication system is a team effort, including the student, family, speech-language pathologist, teacher, occupational and/or physical therapist, and significant others in a student's environment.

4. The speech-language pathologist must be knowledgeable about available and appropriate resources, especially regarding augmentative communication systems and the rapidly developing technological advances within these systems, as well as possible funding sources for these systems, according to each student's and family's individual needs.

E. Service Delivery

1. Modes of service delivery may vary according to an individual student's needs; these modes may include direct or indirect services, or a combination of these.

2. Indirect treatment does not mean waiting for "communication readiness", but rather working directly with the significant persons (parents, teacher, etc.) in the student's natural environment to develop daily use of specific communication programming strategies to reach targeted communication goals. Regular demonstration of programs with the student and observation of program implementers with the student (e.g. classroom personnel) must be provided in order to judge the adequacy of the proposed program.

F. Transdisciplinary Approach

1. Speech/language pathologists should be prepared to function as members of a large network of human service providers working toward common goals for individual students and their families.

2. The speech-language pathologist, in developing a communication strategy or system, must be aware of the student's overall abilities and disabilities, and should seek consultation as needed from specialists in associated fields. For example, PT/OT consultation must be accessed for the student with motor disabilities when the selection and use of a signalling instrument or communication system is made. Thus, the positioning and use of the student's body can be carefully considered so as not to increase or create structural deformities and/or abnormal muscle tone and movement patterns.

3. Positioning of both the student and the communication system/materials are of the utmost importance in developing a communication program.

4. A comprehensive transdisciplinary program requires sharing the information, strategies, and techniques of the various disciplines in a cooperative effort.

5. Each team member should be aware of their own performance in relation to established standards and should be willing to carry out adjustments needed for meeting those standards.

6. Speech/language pathologists should be prepared to identify their own and their program's strengths and weaknesses to effectively share and receive information as a member of a therapeutic/educational team.

III. STUDENT DESCRIPTORS

POINT I. There are so many varying definitions or characteristics associated with students who have been described as having: multiple handicaps, moderate handicaps, trainable level handicaps, severe handicaps, profound handicaps, physical handicaps, and orthopedic handicaps. How do you describe such students?????

POINT 2. There are some "standardized" terms found in various places, e.g. the Kentucky Severity Rating Scale (KSRS) available from the Kentucky Department of Education, Office of Education for Exceptional Children (See Appendix H for address).

POINT 3. This manual provides information on program development for the students whom you are currently serving. Describe your students in terms of:

A. most typical

B. most difficult to treat

POINT 4. Now, think of the students about whom you are most concerned and:

A. keep him/her in mind as you read this manual;

B. begin to note on outlines, etc. information in this manual, which is directly applicable to your students; and

C. be ready to use this information to design an assessment plan and overall "plan of action" for your students.

IV. Summary:

WHO? 1. First, think about your students.

WHAT? 2. Next, what are the areas of assessment for these students?

HOW ? 3. How do we assess these students, including:

WHERE? where - what environments ?

WHEN? when - in what activities?
for what length of time?

HOW? with whom?
with what instruments or other assessment techniques?

WHY? 4. To look at overall needs (referrals).
To look at **abilities** as well as deficits.
To look at specific communications needs.

To determine what opportunities for communication are available to a student in a variety of environments.

To relate assessment immediately to intervention.

To develop the overall "Plan of Action" for a student(s), which complements and strengthens the student's overall educational program across all 4 domains of daily life (domestic, vocational, community, and recreation/leisure).

V. LOOKING AND SPEAKING IN NEW WAYS

POINT I. Respect for the student as an individual:

A. How do I view my students?

B. How is he/she like other students? (i.e. his/her nonhandicapped peers in "regular" classes)

C. How can I help him/her to be more like his nonhandicapped peers within a communicative environment?

D. How can I facilitate communication goals necessary for functioning in integrated, age appropriate environments?

POINT 2. Our Words Speak As Loudly As Our Actions:

A. How do I refer to my students?

"He's TMH" or "John is a student who has_____ (type) of handicapping condition." (or has x type of challenge)

B. How do I talk to my students?

C. When, where, and with whom do I discuss my students?

POINT 3. Can my students progress?

A. In what areas? socially? academically? in a greater number of environments? in observably more "acceptable" behaviors?

B. Toward greater independence and self esteem by: making choices? by initiating? by requesting? by expressing emotion? by refusing in more standard (socially acceptable) ways?

C. By improving the image of our students via: increased peer interactions? participation in age-appropriate activities (e.g. color matching clothing wardrobe rather than blocks, localizing to the waitress' voice in a restaurant rather than to a bell or a tape recorder in the classroom or speech room)? managing aberrant behavior by analyzing its communicative value?

THESE AREAS NOW BECOME THE FOCUS OF OUR ASSESSMENTS AND TREATMENT PROGRAMS.

ARE WE NOW READY FOR SOME "REDEFINING"?

ASSESSMENT STRATEGIES

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ASSESSMENT STRATEGIES

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I. WHAT IS COMMUNICATION?

A. Your Definition: (Please take a moment to write out your understanding of the term "communication")

B. Group Consensus: (If using this manual for training purposes, record the group's definition of communication, or the additional points the group offers that you feel would enhance your own definition above.)

C. The Equation: Successful Communication = Intent (Function) + Type of Initiation or Response (Form) + Listener's Comprehension.

That is, we wish to express an idea or intent so we encode it into some form or mode. We hope our listener comprehends our message and that the message has the desired effect upon him/her.

Intent = function or thought, e.g. labels, refusals, greetings, negations, affirmations, sharing information, etc. based upon: referents* and knowledge drawn from the environment + the ability to comprehend, formulate, store, recall, and use this knowledge.

Topic = *referents i.e. what are we talking about?. These are developed by our experiences with the environment and are the reflection of each "speaker's internal schemata" (McLean & Snyder-McLean, 1978) via channels of input (the senses) receiving stimulation from active interaction with the environment. Other researchers (McDonald, 1982) use the word "**content**" to refer both to the "social contact purpose" (intent) and "semantic relationships" or the meaning and vocabulary used to express that meaning. We will refer to this second element as "topic". McDonald notes that these refer to both linguistic (word) and non linguistic (gestures, etc.) output. See page 34 of this manual for descriptions of basic semantic relationships used in early one and two word utterances (or units in the case of nonverbal communication).

Type of Initiation or Response = some form of observable behavior involving verbal, vocal, gestural, eye, facial, muscle tone, body position, aberrant behavioral output; the form or mode of the communicative output.

Researchers tell us that there are at least three levels or forms of **speech performative acts** which comprise expressive output. These are **locution**, the highest level, which is the formal language-making level. At this level, intent is expressed via a rule based, standardized and mutually understood system (e.g. symbolic language). The next level is that of **illocution**. At this level, intent is expressed in a regularized, non-standard, but understandable form of output, (point, reach, etc.) The last level is that of **perlocution**. At this level, expressive output is observable, but the intent or meaning is interpreted by the listener, and the speaker is not credited with having communicative intent. For example, an infant who cries at age 2 months may be responding to some physiological state. However, we do not know for sure the exact intent of the output, and neither does the infant (other than the fact he/she is probably having some discomfort). We interpret his/her output as we believe it to be. Hence, Mom says, "I hear you crying. You must be hungry (or wet, or tired, etc.)" (Bates, 1976).

Some researchers insert levels somewhat between illocution and perlocution in which an individual's behaviors are "purposeful and intentional," (e.g. person reaches out and grasps an item, but he is not intentionally communicating). Next, are two levels of intentionality, but they are non-standardized communication. The first level is primitive intentional in which "behaviors are directed to a person or object, but not both." The other level is called conventional intentional communication, in which "behaviors are complex coordinations of expressing communication intent through objects/ events and other persons. They are characterized by gestures and/or intonation patterns (Stremel-Campbell, 1985). Stremel-Campbell describes several levels of complexity regarding the use of locutionary language as well. Though too lengthy to be detailed here, the reader is encouraged to become familiar with this information as it will enhance their abilities in both assessment and intervention of severe communication deficits. See Recommended Readings and References at the end of this module.

Listener's comprehension is dependant upon the use of a mutually understood system of transmission about a common referent.

Expressive Communication = Intent + Topic + Output Mode(s) (form) + A Supportive Environment

Intent = see previous definition

Topic = see previous definition

Output Modes = any form of mutually understood transmission system, (e.g. verbal, vocal, written, facial expression, gestural, computerized, etc.).

Supportive Environment = competent listener (one who understands the "speakers" communication output system), situation conducive to receiving the message (e.g., quiet enough, adequate lighting, etc.).

THESE EQUATIONS (TYPICAL/NORMAL COMMUNICATION) PRESUPPOSE NORMAL CENTRAL NERVOUS SYSTEMS, COGNITION, SENSORY SYSTEMS, MOTOR SYSTEMS, and USE AND COMPREHENSION OF LANGUAGE.

Because our students with sensory, motor or cognitive handicaps often do not have normalcy across these equations, breakdowns in communication occur. These breakdowns can occur in any of these components: not only at **intent**, **topic**, and **output** modes which pertain to the sender, but also, at the competency of the **listener (supportive environment)** which refers to the listener or the receiver of the messages. Our students may very well be expressing communicative intents, but if we are unable to "read" these messages (because we consider only locutionary language as communicative), WE MAY NOT BE COMPETENT LISTENERS.

D. "Language" vs "Communication"

1. Language implies standardization, rules, and symbols; and therefore, mutual understanding by individuals who share knowledge of this language system.

2. Communication implies a much broader set of output behaviors and combinations of output behaviors which may or may not be of a standardized form, but which convey intent and are understood and "readable" by the listener.

II. MOTOR AND SENSORY CONSIDERATIONS

A. The equation presupposes normal "systems" including: a normal central nervous system (CNS), cognition (e.g. comprehension, retention, storage, recall, formulation, etc.), motor, and sensory (vision, hearing, touch, movement, taste, smell), which allow a person to actively interact with the environment.

PROBLEM: Do students having severe and/or multiple handicaps usually have adequate motor, sensory, and cognitive systems?????????

And what happens when they do not???????

These students are not non-communicative, but often their communications are more difficult to "read" and understand.

B. **Motor:** Typical babies and children develop sets of movement patterns in a relatively sequential manner. The patterns gradually become more complex and are built upon previously acquired patterns, muscle tone, CNS functioning, and maturation. There is an interdependency between communication development and motor and sensory development. Adequate motor development allows for productive interaction with the environment from which we gain knowledge and develop our "referents" for communication. In addition, communication is based on our ability to use motor movements) gestures, speech, gaze, facial expressions etc.) to express our thought or intent. It naturally follows that abnormal motor development can affect a child's ability to clearly communicate, speak, move, and interact with the environment.

Suggested Readings & Resources

Alexander (1980)
Alexander & Bigge (1982)
Campbell (1987; 1989)
Morris (1981; 1987a; 1987b)

Pediatric physical and occupational therapists, speech pathologists having background in Neuro-Developmental Treatment (NDT); NDTA (Neuro-Development Treatment Assoc.), PO Box 70, Oak Park, IL 60303, (312) 386-2454.

III. SENSORY DEFICITS

A. **Hearing:** We know well that deficits in hearing and auditory processing, and attending abilities, along with recurrent ear problems, can have very significant effects on language and communication development.

B. **Vision:** Visual deficits take on much importance when cognitive and motor deficits are also present. Such deficits decrease an individual's abilities to actively interact with his environment. Visual acuity, eye pointing, eye gaze sequences, and body positions (which can maximize or interfere with eye/head control and therefore useful vision) become very important for some students with physical handicaps. The lack of good peripheral and/or central vision and visual disregards can become road blocks to the development of certain augmentative communication systems which may be necessary for some nonspeaking students.

C. **Tactile/Touch:** There are many forms and types of tactile or touch input. Some types of tactile input include light vs. firm and deep, slow vs. fast, sustained vs. interrupted (e.g. tapping), and rough vs. smooth. There are varieties in textures and temperatures as well. Some individuals have abnormal responses to tactile input. They retain more of a defensive rather than discriminative reaction to touch. Others attend to other sensory input (e.g. auditory, visual) and respond much better to such input, when tactile input is provided. Still others are quite distracted by touch input. Knowledge of such responses are necessary when designing intervention programs which might include tactile cuing or tactile exploration.

D. **Taste and Smell:** These sensory inputs may be useful in alerting some students; may be quite distracting and therefore, impede attending in some students; or they may be aversive to particular students and therefore, result in lack of participation in the activity. A student's likes and dislikes in these areas are quite important in development of programs focused on requesting or refusing, or in feeding programs.

E. **Movement:** Like touch, certain forms of movement may facilitate better attending and processing of other sensory stimuli, and may help normalize muscle tone, etc. In other students, movement may be very disorienting or frightening, or may be counter indicated because of its effect upon muscle tone. Again, these variations must be considered when planning intervention programs for students with multiple handicaps.

Suggested Readings & Resources

Ayres (1972; 1979)
Gilfoyle et al. (1981)
Kentucky Deaf-Blind Intervention Project (see Appendix H)
Pediatric Physical & Occupational Therapists
Rosenwinkel, Kleinert & Robbins (1979-80)

IV. Cognition: A FEW THOUGHTS

A. There are many resources for communication programming for students cognitively functioning at a 9 months levels or above. In an article entitled "Assessment of Cognition and Language Through Play", Carol E. Westby (1980) provides an assessment scale that includes play activities for eliciting the Piagetian stages of cognitive development. These are then related to language and communication. However, the scale begins at 9 months

cognitive level. This is the stage in which illocutionary output begins as well. Strategies in this article are most useful for the child or student functioning at/or above the 9 months level cognitively.

Suggested Readings

Westby (1980)
Halle (1984)
Neetz, Haring & Tomlinson (1984)

B. There is much controversy as to whether certain cognitive prerequisites must be attained by a student before communication programming can begin. Such abilities as object permanence, tool use, means-ends, symbolic and representational levels of cognition are held up as the most important of these. While such skills are certainly necessary at later illocutionary and locutionary levels of language functioning, this may well not be true for fostering perlocutionary toward illocutionary output. The work of researchers in the area of pragmatics allowed definitions of very early levels of communicative output and therefore gave a framework for very early communication programming. The work of Stremel-Campbell (1984), as noted before, also offers descriptions of very early communication acts. There are those who are finding that at some levels, language development actually facilitates cognitive development. One of the major focuses of this manual will be to provide information for development of communication programming for individuals functioning at perlocutionary levels or for students functioning at the severe/profound ranges.

McDonald (1982) describes a concept called the "ubiquity principle" which says that "all behavior communicates and thus, you cannot <u>not</u> communicate" (p. 119) He further contends that:

> a corollary (to the ubiquity principle) grounded in behavioral principles, is that if all behaviors have communicative effects then, they also have natural teaching effects since any communication provides contingent feedback and cues the child's immediate behavior. Thus, the very act of communicating with a child is teaching the child how to communicate. (p. 119)

Suggested Readings & Resources

Yoder & Villarruel (1985)
Siegel-Causey & Downing (1987) (Communication principles presented in this article are excellent; however, actual activities used in the example for the student who is a student with abnormal muscle tone are not a good example of a team approach to program development regarding the sensory and motor/movement activities chosen to be utilized with the student and should not be imitated without specific input from pediatric physical or occupational therapists.)
Fey (1986)
Fieber (1978)
Fogel & Esther (1987)
Stremel-Campbell (1985) (and other publications by Stremel-Campbell currently at the University of Southern Mississippi, Hattiesburg.)

V. ASSESSMENT OF THE STUDENT

A. Does this student communicate at any level????

Before beginning a communication assessment, a certain framework is established. Central points in the framework include:

1. Focusing on what a student can do as opposed to what he/she cannot do; what **abilities** are present?

2. Thinking of each unit of observable behavior as an event. Do we observe verbalizations, vocalizations, gestures, body movements, eye use, muscle tone changes, gazes, facial expressions, etc. which produce an effect or interaction with a listener? (even if the listener is only interpreting this output as meaningful)

3. When and where do these events occur? For example:
   a. around whom?
   b. in what surroundings? (e.g. quiet vs noise)
   c. during what activities? (e.g. feeding, during play or movement activities)
   d. in what body positions?
   e. in what emotional state?

4. Types of assessment tools used vary by necessity due to the varying levels of student functioning. "Standardized" instruments alone may well give us very little information, since we are looking for any evidence of output from the student which could be eventually shaped into a higher level or a more standardized form of communication.

5. Who can help us to "know" this student? (family/parents/care-giver, teacher, siblings, peers, bus drivers, OT/PT, classroom teaching assistant)

   We can no longer function in an isolated model/framework of assessment with this population of students.

B. Where is all this leading? (Keep in mind there are a variety of service delivery models available.)

1. Varying types of assessments--moving away from the use of standardized instruments and using observational techniques.

2. Varying locations for assessments; Should we move out of the traditional one to one setting to conduct assessments to a natural or "real world" setting?

3. Varying individuals who participate in the assessment either directly or indirectly; Making use of the concept of the transdisciplinary team and include parents, siblings, nonhandicapped peers, OT, PT, teacher, significant others, etc.

C. An Assessment Format

What follows is a very detailed format by which to look at the total person we are to assess and to eventually provide a communication program. The form is detailed for discussion sake, but hopefully highlights the major points of this section of the manual which include:

1. Every student has the potential for communication at some level.

2. Many students are already communicating, but their communication is often not recognized as such.

3. We must become competent listeners, focusing on what a student <u>can</u> do rather on what he/she cannot do. We must work to determine what abilities are at his/her disposal right now that may be used as forms of communication. We must look for any expression of communicative intent. We must determine to what sensory input a student attends and what sensory input elicits observable output from the student.

4. We look at the student's current assets which can be used as building blocks through which he/she can raise his/her level of communication to be more intentional, then regularized, and be easily understood by a variety of people in a variety of settings.

We will now walk through this process in a very detailed manner. An abbreviated assessment form (with program development suggestions) appears in Appendix C and is based upon this descriptive and detailed format discussed in the following sections.

REMEMBER: FOCUS ON THE STUDENT'S ABILITIES NOT ON HIS/HER DISABILITIES

Don't focus on what he/she can't do LOOK FOR WHAT HE/SHE CAN DO! And go from there.

IV. THE ASSESSMENT (INVENTORIES)

QUESTION 1. Does the student communicate in any form?

A. (Speech) Performative Acts

1. Perlocution
2. Illocution
3. Locution

B. Communicative Intents

1. Imperatives--demands
2. Declaratives: comments, labels, calling
3. Requests: people, activities, items
4. Negatives: refusal, protests, denials
5. Interrogatives
6. Affirmations
7. Expression of emotion
8. Sharing information
9. Providing information
10. Making choices
11. Greetings
12. Reply\Answer
13. Others

QUESTION 2. What is the student's behavioral state: (before stimulation)

A. Asleep

1. deep sleep
2. light sleep

B. Drowsy
C. Quiet Alert
D. Active Alert
E. Crying
F. Agitated Cry/Scream

Suggested Readings

Bailey & Wolery (1989)
Guess et al. (1988)
Williams (1978)

QUESTION 3. How and when does the student communicate?

A. Type:

1. **Initiation**--(the most important)
2. **Response**
3. **Imitation**

B. Primary Mode(s) of Communication

1. **Responses:** Under what conditions does the student "respond" to input? by 1) alerting to or 2) reacting to or showing awareness of sensory stimuli.

   a. **Auditory:** voice familiar/voice unfamiliar sound, noise, music, pitch, rhythm, rate, loudness, inflection, etc.
   b. **Touch**: type, deep vs. light, continuous vs. interrupted, rate, temperature, texture, etc.
   c. **Movement:** speed, direction, rate, security of body position, etc.
   d. **Visual:** Color, size, intermittent vs. still, lights, gestural, print, graphics, position/range, disregards, etc.
   e. **Taste**
   f. **Smell**

   Any combination of the above?

g. **Description of Response**--any form e.g. body movement, change of muscle tone, position, localization to stimuli, eyes: look, blink, open, move, close, change of emotional state, reach, touch, bang, grip, point, vocalization, squeal, scream, cry, jargon, etc.

Any combination of the above?

2. Engaging Behaviors:

a. Type: shared focus, line of regard, tracking, touch, smile, laugh, turn to sound, look/gaze, eye contact with others, touch localization, etc.
b. Eliciting stimuli: what, who, where, how, length, etc.
c. Time/Length of input
d. Time/Length of the engagement
e. Position of student
f. Position of stimulus
g. What terminates the engagement? (e.g. overload, distractions, time, fatigue, lost of interest, loss of novelty, etc.)

3. Anticipatory Response:

a. Stimuli or situation which elicits anticipation: single or multi-sensory input
b. Type of input: movement, music, vocal intonation or melody, voice quality, repetitive actions, gesture, "game", item, word
c. Observable behavior of student: body or eye movement, change in muscle tone, showing excitement, fear, etc.; body in readiness state for activity; does something or gets something which is linked with the anticipated activity

4. Comprehension of: (Look for right\left disregards in all sensory systems. Note body position of student for each activity.)

a. Verbal input: type, length, characteristics of stimuli, type or level of vocabulary, semantics, syntax, pragmatics*
b. Gestures: length of presentation, type (natural vs. sign,) characteristics of stimuli, position of "speaker" and student
c. Actions: type, characteristics (single/multi-sensory, slow vs. fast, distance from student, adult vs. peer, etc.)
d. Real objects: type, sensory characteristics, placement of object, etc.
e. Miniatures: characteristics of stimuli, placement of stimuli
f. Pictures: types, characteristics (color, figure ground, size, +\- texture, shape, single\multi, placement of stimuli, realistic photos, line drawings, etc.)
g. Any combination of auditory, visual, gestural input
h. Texture: type, characteristics

i. Sign: type, rate, etc.; quantity understood, list those understood if possible
j. Print: characteristics (size, type, color, placement)
k. Braille
l. Graphics: size, placement, color, etc.
m. Symbol systems: BLISS, Rebus, size, placement, etc.
n. Formalized tests of language and academic skills: vocabulary, basic semantic relations, concepts, syntax understood, etc.*

***NOTE: These areas require specialized assessments which may have to be adapted for students with motor and/or sensory impairments.**

5. **Expressive Communication** - Output Observed

a. Describe type:

1) Motor: gestures; movement; change in body position; change in muscle tone; eye gaze; movement of body part(s); actions such as, bang, grasp, point, touch, push away, etc; facial expression; head movements (nod, shake, etc.)

2) Vocal: squeal, scream, cry, jargon, yell, laugh, grunt, etc.

3) Verbal: echoic, echolalic, perseveration, imitation, meaningful/self initiation, response,

4) Any combination of the above

b. Turn-taking: student's understanding of the give and take sequence of communication ("Pragmatic" evaluation information)

1) Vocal contagion (or motor)
2) Mutual imitation
3) Spontaneous imitation
4) Imitation within repertoire
5) Imitation of novel stimuli
6) Question-answer (teacher-student)
7) Question-answer (student-teacher)
8) Maintenance of a "conversation" (for students at an illocutionary and locutionary level)

a) Topic maintenance
b) Reliability
c) Clear references
d) Socio-linguistic softeners
e) Amount of information provided
f) Use of <u>syntactic</u> forms which have pragmatic relevance

c. Locutionary Language (e.g. verbal speech, sign, print, electronic device):

1) Vocabulary
2) Use of basic semantic relationships (Brown, 1973; Bloom & Lahey, 1978)*

a) Nomination: "a sock"
b) Recurrence: "more cookie", "another ball"
c) Negation:
Non-existence: "no shoe"
rejection: "no cookie"
denial: "no kitty"
refusal: "no eat"
d) Agent + action: "mama eat"
e) Action + object: "eat cookie"
f) Agent + object: "mama cookie"
g) Action + locative: "sit bed"
h) Entity + locative: "boy bed"
i) Possessor + possession: "mama sock"
j) Entity + attribute: "big shoe"
k) x + locative: "sock here"

3) Use of higher levels semantics*
4) Use of vocabulary*
5) Length and complexity of utterance* (syntax)

d. Oral speech

1) Intelligibility of speech
2) Vocal quality, (pitch, characteristics of phonation voice, etc.)
3) Prosody (rate, inflection, intensity, timing, rhythm, breath usage, support, and control, etc.)

e. Oral motor, structure and function of oral mechanism
f. Feeding: (Discussed below under section entitled "Areas Requiring Specialized Evaluations".)
g. Respiration/phonation: (Discussed below under section entitled "Areas Requiring Specialized Evaluations".)
h. Potential for use of augmentative systems for communication
i. Cognition: current levels of functioning *

***NOTE: These require adaptations of standardized instruments if the individual has sensory and/or motor impairments. "Scores" may be significantly deflated by lack of motor skills, lack of expressive communication, or lack of a clear response mode. Consider this when interpreting such testing. Selection of the mode of presentation for students with sensory impairments and selection of response and expressive modes require a team approach.**

C. The Environments:

Cataloging and assessing the student's daily environment within the domains of domestic, vocational/academic, community, and recreation/leisure. The purposes of this aspect of evaluation are several:

1. To determine what type of varying environments is the student exposed during a typical day or week? What activities/tasks does this student typically do?

2. To determine if these environments actually offer opportunities for the student to communicate (both to respond AND to INITIATE):

    a. classroom
    b. bus
    c. home
    d. PT\OT
    e. adaptive PE
    f. lunch
    g. circle time
    h. leisure time activities
    i. peer activities
    j. play
    k. specific persons
    l. school personnel
    m. community-based instruction

3. To determine other possible age appropriate environments in which the student might, could, and should be involved.

4. To determine the communicative abilities the student must have in order to participate in the environments listed under #3 above: e.g. what must the student have to be able to participate in community-based instruction (CBI) which the classroom teacher may have already initiated; what are the communicative abilities the student must possess if he/she is to be successful in a vocational/work setting, to be successful in an integrated 4th grade setting, etc.

Suggested Readings & Resources

Two articles on integration of students with severe handicaps:
Brown et al. (1983)
Zivolichi et. al. (1984)

Contact state agencies listed in Appendix H for information, consultation, and technical assistance.

Examples of local catalogs can be obtained from SHIPP (Deaf Blind Project), SPLASH courses, and the Kentucky Systems Change Project. (See Appendix H for contact persons to obtain these.)

Question 4. Are there any interfering systems? (these require team assessment) Are there systems (e.g. motor or sensory) which interfere with the student's abilities to comprehend/use communication to participate in a variety of environments of daily life?

A. Sensory Systems: What sensory systems are facilitating/strengths or inhibiting/weaknesses?

	Facilitating/Strengths	Inhibiting/Weaknesses
1. hearing		
2. vision		
3. touch-tactile		
4. movement		
5. taste		
6. smell		

B. Motor: Interfering Characteristics

1. Muscle tone: hypertonic, spastic, hypotonic, fluctuating tone, ataxia, athetosis
2. Associated reactions: what are they and when do they occur
3. Abnormal movement patterns

SITE	PATTERN	ABILITIES AFFECTED
head/neck	ATNR STNR extension flexion	Capital flexion/neck elongation ("chin tuck"), head/neck control, eye gaze/eye point, feeding, speech, etc.
trunk	lack of balance of flexion/extension asymmetry	respiration, phonation; weight shifting, weight bearing; lateral movements, etc.
pelvis	position of pelvis anterior/posterior tilt fixed position	rotational patterns, balance reactions, etc.; respiration/ phonation.
extremities	arms/hands, legs/feet	abilities to point, touch, activate switches, etc.

4. Physical illnesses: seizures, respirator dependent, need for suctioning, aspiration, allergies, etc.

C. Adaptations/Considerations for Motor and Sensory Aspects of Assessment

1. Motor

   a. Who is involved? Parents, teacher, occupational and physical therapists, speech-language pathologist and others as needed

   b. What can be varied? Position of student, position of materials, handling of student, varying timing and type of incoming stimuli (associated reactions), type of response required, size of stimulus, amount of time allowed for student to respond, etc.

2. Sensory

   a. Auditory: pitch melody, loudness, rhythm etc. (see assessment form in Appendix C)

   b. Visual: type of objects or graphics, shape, size, position, rate of presentation, color, gestures used, etc.

c. Touch: type of touch, (see assessment form in Appendix C)

d. Movement: (see assessment form in Appendix C)

e. Smell and Taste: used for alerting, (see assessment form in Appendix C)

f. Kinesthetic: types

3. Working with Other Specialists on the Team. Who are they?

a. **Physical Therapist:** Motor specialist who works with gross motor development, muscle tone, positioning, handling, ambulation modes, adaptive equipment.

b. **Occupational Therapist:** Motor therapist specializing in fine motor development; sensory development, especially touch and movement input; upper extremities; self-help skills; adaptive equipment; increasing attending via sensory input; sometimes feeding abilities, some visual motor skills.

c. **Specialists in visual impairments:** Usually an educator who can offer specialized assessment and programming suggestions for maximizing a students potential use of vision, can help estimate the students functional use of his/her vision, can offer suggestions for materials providing best visual input for a particular student or provide best compensations for a particular student's visual deficit.

d. **Audiologist:** Specialists with at least a Master's degree in the field of Audiology who can assess a student's hearing acuity and use of hearing, and can provide much input on use of amplification and increase auditory processing abilities. The speech-language pathologist is probably most used in teaming with the audiologist.

e. **Teacher of the hearing impaired:** Speech-language pathologists are well experienced in teaming with the specialist in hearing impairment. They can provide much input regarding the use of specialized equipment, improving use of residual hearing, making speech and sound more salient, teaching procedures for students with hearing impairment and use of total communication.

f. **Special Educator:** Teacher who has specific training and certification in one or more areas of education of students with learning disabilities, mental retardation, physical handicaps, or multiple handicaps. Teachers vary in their expertise according to training, certifications, degrees and teaching experiences.

g. **Specialist in Deaf/Blind Education:** Often a special educator who has specialized in education of students having dual sensory impairments. Kentucky has a Deaf-Blind Intervention Project whose personnel are available to classrooms/teachers in the state who have students with a combination of both hearing and vision impairments (see Appendix H for contact persons).

4. What questions are appropriate to ask of these professionals?

   a. Physical Therapist: Ask questions regarding . . .

      1) Muscle tone
      2) Adaptive seating
      3) Handling (lifting, moving, input to facilitate normalization of muscle tone, etc.)
      4) Appropriate positioning for feeding, toileting, use of an augmentative system, etc.
      5) Techniques for improving respiration
      6) Ambulation/mobility

   b. Occupational Therapist: Ask questions regarding . . .

      1) Sensory input (tactile/touch, movement, auditory, visual, olfactory/smell
      2) Upper extremity use as for augmentative systems
      3) Sensory input to aid in increasing alertness and attending
      4) Adaptive equipment
      5) Positioning for use of eyes, augmentative communication systems, etc.
      6) Designing self-help programs
      7) Input regarding feeding programs

   c. Specialist in Visual Impairment: Ask questions regarding . . .

      1) Best positioning of materials
      2) Selection of material for example: size, color, etc.
      3) Lighting
      4) Increasing saliency of input
      5) Possible sensory disregards, visual field deficits
      6) Information regarding visual field(s) student does/does not use well
      7) How to compensate for visual impairment
      8) Aid in teaching student to manipulate and move through environment.

   d. Audiologist: Ask questions regarding . . .

      1) Degree and type of hearing loss
      2) Characteristics of hearing aid, hearing loss, and amplification devises

3) Location of seating in classroom
4) Suggestion regarding improving auditory processing skills

e. Teacher of hearing impaired: Ask questions regarding . . .

1) Total communication
2) Making speech and sound more salient
3) Speech reading
4) Adaptive/amplification devices
5) Seating in the classroom
6) Sign language
7) Use of residual hearing

f. Special Education Teacher: Ask question regarding . . .

1) Data collection
2) Behavior management
3) Community based instruction
4) Vocational goals
5) Academic goals
6) Domestic goals
7) Recreation/leisure goals (communication programming will be integrated into these)

g. Specialist in Deaf-Blind Education: Ask question regarding . . .

1) Adaptation of assessment instruments and techniques for students with
dual impairments
2) Most salient materials
3) Compensatory modes of input and output
4) Best alerting cues
5) Assessment of other sensory channels for use

NOTE: In all cases consultation and information provided by specialists should be used to proceed, to facilitate, be related to, and/or be used in functional skills, abilities, and activities.

Question 5. Does the student exhibit problems which require specialized evaluations by a speech-language pathologist with appropriate expertise?

A. Oral Motor and Feeding:

Oral motor and feeding evaluation and intervention is a highly specific and technical area. Feeding is important to the speech-language pathologist (SLP) for several

reasons. All specialists are concerned with the student's health and nutritional status. However, the SLP is especially interested in the student's response and toleration to touch in and around the mouth, coordination of respiration and swallow, coordination of respiration and oral movements, oral motor planning skills, ability to sequence oral and respiratory movements, and general control over the oral, and respiratory systems that are involved in oral speech. Further, the SLP is concerned about the overall body movement patterns, muscle tone patterns, and associated reactions that have an effect on the oral and respiratory systems. Evaluating the feeding skills of a student gives the SLP much of this information. There are similar movement patterns and shared musculature used in feeding and in oral speech. It would be impossible, in a manual such as this, to fully discuss a complete feeding assessment. However a few comments regarding feeding can be made.

1. Feeding development proceeds in a definite, observable sequence.

2. Feeding facilitates oral-motor control and therefore may facilitate some speech development or at least some improved oral output in many students.

3. Feeding facilitates social interaction between parent and child and others.

4. Development of feeding skills facilitates greater independence for persons with severe handicaps.

5. Feeding assessment and intervention require a team approach, as feeding requires a variety of input and results in such varied skill acquisition.

6. Feeding requires coordination and sequencing of the systems involved in oral movement and respiration.

7. Factors to consider in designing feeding programs include:

   - Tactile preferences,
   - Correct positioning,
   - Correct handling procedures (relaxation and facilitation of body and oral musculature),
   - Selection of foods,
   - Selection of utensils (pre-feeding, feeding, self-feeding), and
   - Consideration that a feeding program must be implemented utilizing a variety of service delivery methods (home programs; school programs; direct therapy and consultation with teachers, parents, and other team members which continually generates new, varying positioning and facilitation techniques).

8. There are sophisticated assessment procedures such as the Modified Barium Swallow Video - floroscopy, to assess swallowing and check for aspiration.

Finally, and most importantly for the SLP, feeding interaction times provide opportunities for the student to COMMUNICATE in a variety of ways including choice making, indication of likes and dislikes, signaling when he/she is ready for food or more food/drink, when he/she is full, when he/she needs to take a break, when he/she does and does not need help, and when he/she is finished.

Suggested Readings & Resources

All articles and books by Suzanne Evans Morris, Rona Alexander, and Jeri Logeman. (See Recommended Readings & References at the end of this module.)

NDT based courses by such individuals as (courses usually referenced under "upcoming courses" section of ASHA monthly journals):
Rona Alexander
Suzanne Morris
Lyndell Jones
Leslie Faye Davis

Articles in the Neuro-Developmental Treatment Association (NDTA) Newsletter, PO Box 14613, Chicago, IL 60614

B. Respiration/Phonation

Respiration patterns and phonation patterns are of marked importance to the SLP. They are areas which play a large role in the ability to use oral speech. If these are significantly impaired by muscle tone problems and\or motor planning deficits, there may be serious problems in the student's ability to develop oral speech. Additionally, if a student's efforts to coordinate respiration, phonation, and oral movements result in associated reactions (increased involuntary movement or muscle tone) in the rest of the body, the SLP must be aware of this situation and be able to help position and handle the student so as to minimize such a result. If the student's motor disabilities are so severe in the head\neck, trunk, and abdominal areas of the body as to preclude the functional use of the respiratory, phonatory, and oral mechanisms in a coordinated fashion for speech (one of the most finely controlled and finely sequenced set of movements that the body must perform), the SLP must then devise an alternative or augmentative mode of communication for such a student. It would be impossible to discuss assessment of respiration\phonation patterns in detail in a manual such as this. References and resources for such information are listed in the "Feeding" section above.

Question 6. Are there alternatives to "standardized assessment" for further data collection to determine communication needs?

A. Systematic Sampling:

Systematic Sampling is a form of data collection that looks at specific behaviors and their antecedents and consequences as they occur during a specific period of time or situation (Rieke et. al., 1977).

When assessing the communication abilities of a student, it is best to spend some time sitting back and watching the student in natural environments and situations. Consider the following:

1. What questions do you want to answer? (See assessment form in Appendix C)
2. What are the most important and pressing questions or concerns of the family? the teacher?
3. Systematic sampling can also be used as a pre/post measure of a specific communication goal or targeted behavior.

B. There are at least two ways to do systematic sampling:

1. Time sampling: Select a specific amount of time (e.g. 10 seconds) in which you watch a specific situation or activity. Then record what you saw as precisely as you can using the format described below.
2. Sampling for specific behaviors: Wait for X behavior to occur and record the communicative sequence in as much detail as possible using the formate described below.

Figure 1
The Systematic Sampling Recording Format

The Antecedent:	**The Behavior:**	**The Consequences:**
What has happened to elicit the student's behavior(s)?	What did the student do?	What happened because of the student's behavior(s)?

Be sure that you include the sensory modes in which all behaviors occur (A/V [auditory/verbal], V/M [visual/motor], T/X [tactile/other input]). Include all persons, settings, and materials involved. A blank form used for systematic sampling is included in Figure 2.

Figure 2

Systematic Sampling Form

Student's Name: _____ Class: _____

Person Completing Form: _____ Time: _____ Date: _____

A	B	C
A/V V/M T/X	A/V V/M T/X	A/V V/M T/X
A/V V/M T/X	A/V V/M T/X	A/V V/M T/X
A/V V/M T/X	A/V V/M T/X	A/V V/M T/X
A/V V/M T/X	A/V V/M T/X	A/V V/M T/X

Note:
- T = Teacher
- SLP = Speech/Pathologist
- P = Peer (List names out here)
- A/V = Auditory/Verbal
- V/M = Visual Motor
- T/X = Tactile + other sensory channel
- R = Response
- I = Initiation
- i = imitation

Adapted from Rieke et al. (1977)

Kleinert (1989)
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Question 7: Is there communicative value to aberrant behavior?

Aberrant behaviors frequently have a communicative value, especially in students who have no easily understandable and clear communication systems. Many specialists in the fields of speech-language pathology and special education have provided excellent descriptions of such behaviors. Use of systematic sampling, as described above, is an excellent assessment tool in determining whether there is communicative value in a student's aberrant behaviors. The following is a good example of such a situation.

Case Study:

Yvonne is a 5 year old student who has both hearing and vision impairments. She was nonspeaking, wore glasses and hearing aids, and was ambulatory. She was considered a "behavior problem" in the classroom because she often disrupted group instruction and snack/meal times by screaming and throwing her glasses. The teacher requested that her behavior be sampled so that a "behavioral control" program could be developed.

The first portion of Figure 3 contains a sample of Yvonne's classroom interactions in October. As can be seen in this example, Yvonne screams, yells, points, and grabs when the teacher offers food to a peer. When the teacher ignores Yvonne's "inappropriate" behavior, she throws her glasses. A summary of the overall, initial behavioral sampling revealed the following:

1. 0% response to auditory/verbal commands

2. 75% response to commands given thru gestural-visual modes (+/- auditory/verbal)

3. Initiations: Characterized by screaming, reaching, and tantrums to express;
   a. wants
   b. negation
   c. demands
   d. no interrogatives used
   e. no declaratives

   Perlocutionary to Illocutionary level

4. Imitations:
   a. vocal contagion level only for vocal output
   b. 30% success for motoric imitation

5. Turn Taking - 10% noted when opportunity available

6. Noninteractive behavior most prevalent behavior

7. Nonresponsive behavior 60% of the time when response opportunity was available.

Figure 3

Behavior Sampling for Yvonne (October & December)

A	B	C
(A/V) (V/M) **October** T. has food for snack. All sitting at table. T. asks T.B. "What do you want Tommy?"	(A/V) (V/M) Y. screams, yells, points, grabs.	(A/V) (V/M) "No! Yvonne". gives T.B. foods, asks next child "What do you want Marcy?"
A/V V/M	A/V (V/M) continues above - throws glasses	(A/V) (V/M) "no, Y. - Time for waiting" Puts glasses back on Y.

T = Teacher Y = Yvonne T.B. = Tommy

(A/V) (V/M) **December** T. has food for snack. All sitting at table. T. asks J.D. "What do you want J. D.?"	(A/V) (V/M) Y. screams, reaches	(A/V) (V/M) T. gives food to J.D. Turns to Y, "Oh you want ___." Show me "I want____." Manually shapes signs.
A/V V/M	(A/V) (V/M) "I w" (vocal) allows hands to be shaped for sign	(A/V) (V/M) "You told me Y! Here's ___. You want ___." Signs "want" again.

T = Teacher Y = Yvonne J.D. = J.D.

These data from October, indicated that Yvonne almost never responds to auditory/verbal input, but seems only to be able to respond to gestural/or tactile input. In addition, Yvonne falls somewhere between perlocutionary and illocutionary communicative output. She consistently initiates communications to request (e.g. the food), but these communicative attempts are being viewed as disruptive not communicative behaviors. These can be summarized as follows:

1. Communicative Level:	Between perlocution and illocution
2. Speech Performative Acts:	Imperatives (demands!) Negatives Requests
3. Type of Communicative Behavior:	Initiations - Present Rare response Rare imitation
4. Primary Mode of Communication:	Receptive: Tactile - Visual - Auditory Expressive: Motor - Vocal
5. Turn Taking:	Vocal contagion

It was suggested to the teacher that she view Yvonne's screams, reaches, etc. as a possible communication to request. It was further suggested that she be taught to alter this less acceptable form of requesting to sign + vocalizations.

The second behavioral sampling was performed in December (2 months later) and is shown in the second portion of Figure 3. We see that although Yvonne continues to INITIATE with screams and reaches, she is allowing her hands to be shaped to "want sign" and is even beginning to use a verbal approximation of "I want".

The final behavioral sampling in April (4 months later) is shown in Figure 4, Yvonne has now begun to initiate the request "I want" and sign "want", to follow the teacher's model, and can produce the sentence "I want cookie" both verbally and in sign.

A summary of her communication level now shows her approaching a locutionary level of language (initially she fell between perlocutionary and illocutionary levels). She shows clear communicative intent, can respond consistently if given a question or sign and verbal input, and she is imitating with an 80% success level to motor-vocal and verbal models. She uses 6 words verbally and 8 words via sign. A pragmatic profile for Yvonne in April can be summarized as follows:

1. Communicative Level: Illocution --> Locution

Figure 4

Behavior Sampling for Yvonne (April)

A	B	C
(A/V) (V/M)	(A/V) (V/M)	(A/V) (V/M)
T. has food for snack. All sit at table. T. asks "What do you want John?"	Y. signs "I want." Says "I want"	T. gives snack to John. T. to Y. "What do you want?" Signs "want"
A/V V/M	(A/V) (V/M)	(A/V) (V/M)
	Y. says "I want" + sign	T. says: "Tell me, I want cookie" signs and models.
A/V V/M	(A/V) (V/M)	(A/V) (V/M)
	Y. says: "I want cookie" and signs	T. says: "Oh you want cookie, here Y."

T = Teacher Y = Yvonne

2. Speech Performative Acts (S = sign, V = Verbal, v = vocal):

   Imperatives: S-V-v
   Declaratives: S-V-v
   Negatives: Gesture
   Requests: S-V-v

3. Type of Communicative Behaviors:

   Initiations - Present
   Response - Present (if signed input)
   Imitation - 80% success Motor-Vocal-Verbal

4. Primary Mode of Communication:

   a. Receptive: Tactile - Visual - Auditory (Sign); Can respond to name by auditory cue only.

   b. Expressive: Motor-Vocal-Verbal

5. Turn Taking: Spontaneous imitation of unique repertoire is present if gesture/visual input is given.

   Response to words without sign: 5%
   Interrogation: 0%

6. signs: want, eat, drink, more, wash, dry, I, more

7. says: I, want, dry, more, eat, drink

This is a dramatic example of how "aberrant" behaviors often have a significant communicative function. Had Yvonne's output mode of screams, yells, and reaches been arbitrarily "extinguished" (stopped through the use of behavioral control techniques), we would have taken away her only form of communicative, intentional, expressive output.

For further information on the communicative value of aberrant behaviors, see "Analyzing the Communicative Functions of Aberrant Behavior" by Donnellan, et al. (1984) listed in the Recommended Readings and References section at the end of this module.

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PRINCIPLES OF MOTOR DEVELOPMENT

1. "Normal" motor development proceeds;
   a. in a cephalo-caudal direction (head to tail).
   b. in a proximal-distal direction (midline before distal)
2. Random movements precede stability
3. Stability forms the basis for controlled mobility
4. At any point in normal development, a blockage may occur which may result in abnormal motor pattern development.
5. Positioning assists/facilitates usage of fine motor, gross motor, and speech development.
6. Quality of motor development is just as important as functional motor abilities.

PRINCIPLES OF SPEECH DEVELOPMENT*

1. Speech develops in a predictable and sequential pattern.
2. Speech-language is dependent in part upon cognitive, motor, sensory development.
3. Feeding movements of the oral mechanisms are closely related to the movements we use for speech sounds, e.g. lip closure on the spoon and bilabial sounds; tongue evaluation in a true suck-swallow and alveolar sounds, etc.
4. Both feeding and speech involve sequential, well timed, coordinated, and volitional movements.
5. Feeding and babbling are prerequisite components to speech.

*Adapted in part form S.E. Morris (1978).

STAGES OF VOCAL DEVELOPMENT

I. STAGE ONE - (0 - 1 month of age)

Quasi-Resonant Nuclei (QRN): "vocalizations which include normal phonation, but which possess no consonants and lack full vocalic resonance of mature vowels, ... considerable nasal air emission is present... ranges from a syllabic nasal consonant to a high, mid, unrounded nasalized vowel" (Oller, 1979). Hunger and discomfort cries and vegetative sounds are most common in this stage (Stark, 1978; Zlatin-Laufer, 1977)

II. STAGE TWO - (2 - 3 months of age)

"Gooing": "vocalizations in which QRN occurs in the same breath group with a velar to uvular closure or near closure." /g/ or /ɢ/ often heard. (Oller, 1979)

III. STAGE THREE - (4 - 6 months of age)

The Expansion Stage or Fully Resonant Nuclei (FRN): "A vowel-like sound which might be transcribed as /a/ ... closures are no longer velar or unvular but rather labial ... sometimes (these) are fricatives, but even more often are vibrant ... (or) raspberries (RSP) ... Squealing and growling are familiar at this stage," as is yelling. (Oller, 1979, Zlatin-Laufer, 1977)

IV. STAGE FOUR

Marginal Babble (MB): "sequences of fully resonant vowels alternating with closures of the vocal tract...the majority of MB sequences of consonant-like and vowel-like elements during this period do not possess the vocalic transition characteristics of mature phonologies...(they) are too slow." (Oller, 1979)

V. STAGE FIVE (7 - 10 months of age)

Reduplicated Babbling (RB): "sequences like /bababb/ and /dadada/." Timing is more like that of mature language. Parents often call this speech the child's first words. This stage "is often called the cannonical stage in vocalization development." (Oller, 1979)

VI. STAGE SIX (11 - 12 months of age)

Variegated Babbling (VAR): Babbling in which "the successive syllables are not identical." Different consonants and vowels are entered into the Reduplicated Babbling (Oller, 1979)

VII. STAGE SEVEN

Gibberish (GIB): "infants produce some fully stressed and some reduced syllables within the same utterance" (Oller, 1979). We sometimes call this jargon.

 Compiled by J. Kleinert (1980)

EFFECTS OF GENERALIZED ABNORMAL MOTOR DEVELOPMENT ON
SPEECH, LANGUAGE, COMMUNICATION SKILLS

Motor Disorders Muscle Tone	Prespeech	Pre-language Cognitive	Communication/ Augmentative Systems.
Spasticity/Hypertonicity	Resp/Phon/Oral restricts active movements in all mechanisms for speech.	restricts active interaction with environment	Restrict movement for expressive communication.
Athetosis	Inaccurate movements, no stable base for movement. Especially affects prosodic (grading) aspects of speech.	as above.	Makes efforts to sign, point, gaze, etc. inaccurate due to instability.
Associated Reactions.	Movements in other parts of the body cause overflow with increased ms. tone to speech mechanism and vice versa.	as above.	Efforts to communicate may cause increase tone throughout body.
Hypotonicity	Poor stable base for controlled movements, abnormal pitch slurred articulation. Resp. patterns affected	as above.	Decreased active movements and interaction with people and things.

P. D. Smith & J.O. Kleinert (1989)
Communication Programming for Students
with Severe and Multiple Handicaps
Kentucky Systems Change Project
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FEEDING AND ORAL MOTOR ACTIVITY		AGE OF ACQUISITION	SPEECH SOUNDS HAVING RELATED MOVEMENTS (NOT AGE OF ACQUISITION)	VOCAL DEVELOPMENT	RESPIRATION/PHONATION
Birth.	Swallow and suck.				"Predominantly adbominal or belly breathing; some reverse breathing with cry, effort, etc. . . ." (Alexander, 1980)
Newborn - 1 mo	Suck, swallow, strong rooting, gag, phasic bite.		k,g, (Back of tongue elevated)	Stage One - Quasi Resonant Nuclei (ORN): Normal phonation, but no consonants and lacks full vocalic resonance of mature vowels,... considerable nasal air loss, ranges from a syllabic nasal consonants to a high mid, unrounded nasalized vowel." (Oller, 1979)	More loudness, speed, squeal with cry at 1 mo. (Alexander, 1980)
1 mo.	Sucking, sequences at least 2 sucks before stop to breath and swallow.				Hunger and discomfort cries and vegetative sounds. (Stark, 1978, Zlatin-Laufer, 1977)
2 mos. to	Suckle swallow, pushes some food out, coughes chokes, gags on pureed food from a spoon.			Stage Two - "Gooing:" vocalizations in which QRN occurs in the same breath group with a velar closure or near closure. /g/ or /g>/ often heard. (Oller, 1979)	"Crying differentiates hunger (tense/breathy)" and fussy (non-breathy") up and down intonantions. (Alexander, 1980)
3 mos.	Sequences more sucks before swallowing, still suckles mostley			Glottal Attacks, nondistress cooing and laughter (Stark, 1978, Zlatin-Laufer, 1977)	
4 - 6 mos.	Tongue bowling.		(All require tongue bowling)	Stage Three - The Expansion Stage or Fully Resonanat Nuclei (FRN): "A vowel-like sound, /a/ ...closures are no longer velar or uvular	4 mos.: "as more upright may see more thoracic movement." Sounds supine - throaty; prone - lips; sitting - tongue

FEEDING AND ORAL MOTOR ACTIVITY		AGE OF ACQUISITION	SPEECH SOUNDS HAVING RELATED MOVEMENTS (NOT AGE OF ACQUISITION)	VOCAL DEVELOPMENT	RESPIRATION/PHONATION
4 6 mos. cont.				but rather labial... sometimes (these) are fricatives, but even more often are vibrant.. (or) rasberries (RSP)... Squealing, growling, yelling. (Oller, 1979 Zlatin-Laufer, 1977)	(Alexander, 1980)
5 - 7 mos	Stopping of anticipatory movement on presentation of food	5 mos			
	Lip cleans spoon; suck, suckle or phasic bite/ release on semi-solids	5 - 6 mos	m, b, p, w,		
	Spoon feeding on semi-solids; opens mouth for spoon.	Usually by 6 mos.		6-7 mos. Marginal Babbling (RB): "Sequences of fully resonant vowels alternating with closures of the vocal tract...the majority of MB sequences of consonant-like and vowel-like elements don't possess the vocalic transition characteristics of mature phonologies... (they) are too slow." Oller, 1979)	6 mos. Breathing: Combines Belly breathing with thoracic movements on inhalation (child more upright) sitting and teeth eruptions account for lip, alveolar and vibrant sounds. Back of tongue sounds also occur. (Alexander, 1980)
	Suckle and suck from spoon or cup. Upper lip passive.	5 - 7 mos			
	Munching Begins.	5 - 7 mos			
6 - 9 mos	Lip draws in without jaw.	6 - 9 mos	f, v, m, b, p, w		
	Chewing	6 - 8 mos	Graded jaw control sounds		
7 - 9 mos	Lip Closure - upper lip more active.	7 - 9 mos.	m, p, b, w	7-10 mos: Stage Five. Reduplicated Babbling (RB): "sequences like /dadada/". Timing is more like that of mature language. Parents often call this speech the child's first words.	8-9 mos.: "Breathing: More thoracic movement with more stabile trunk in upright position." Sounds: Combines non-nasal vowels with nasal/oral consonants produced with same place of.
	True suck begins with spoon, cup, etc.	7-9 mos	t, d, n, k, g, l		
8 - 9 mos	Tongue stays elevated with out jaw.	8 - 9 mos	t, d, n, l		

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FEEDING AND ORAL MOTOR ACTIVITY		AGE OF ACQUISITION	SPEECH SOUNDS HAVING RELATED MOVEMENTS (NOT AGE OF ACQUISITION)	VOCAL DEVELOPMENT	RESPIRATION/PHONATION
9 - 10 mos.	Tongue elevation in true suck.	9 - 18 mos.	t, d, n, l	Also called cannonical stage. (Ollem 1979)	articulation. (Alexander, 1980)
	Begins more controlled bite.	9 - 10 mos.	jaw control sounds.		9 mos.: Plays with infectious and pitches (Alexander, 1980)
	Closes lips while chewing and cleans lips when eating. Much more active upper lip. Uses tongue to transfer food to sides; intermittent tongue tip elevation, protrusion or forward backward movement in swallow.	9-12 mos.	t, d, n, l, kg	11-12 mos. Stage six: Variegated Babbling (VAR) Babbling in which "the successive syllables are not identical Different consonants and vowels are not identical. Different consonants and vowels are entered into the Reduplicated Babbling." (Oller, 1979)	11-12 mos.: More thoracic movement may be noted with inhalation. Reverse breathing significantly reduced or absent. (Alexander, 1980) Produces single words.
12 + mos.	Stablizes jaw (externally) on cup.	15 - 24 mos.	Graded jaw sounds.	12 + mos. Stage Seven Gibberish (GIB): "Infants produce some fully stressed and some reduced syllables within the same utterance (Oller, 1979) We somestimes call this jargon. Language begins.	Locutionary language begins.
	Stabilizes jaw	24 - 30 mos.	Graded jaw sounds.		
	Tongue independent of jaw.	9 - 26 mos. (3 stages)	Co-articulated speech.		
	Degree of mouth opening controlled.	24 mos.	Co-articulated speech.		
	Controlled bite.	24 mos.	Co-articulated speech.		
	Lateralizes tongue.	36 mos.	Co-articulated speech.		

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Motor Disorders	Pre-Speech			Pre-Language	Communication Systems
	respiration	phonation	oral	cognitive	
Blocks					
Neck hyperextension	eventually leads to restriction of thoracic expansion in trunk so impedes throracic respiration	interferes with position of larynx	leads to jaw thrust , lip retraction	limits visual gaze and range; limited head control for visual tracking, and auditory localization	limits downward visual gaze, needed for communication board usage
Asymmetry			asym. position of articulators	also limits active interaction with environment	limits eye, head, hand point; limits use of signs requiring symmetry
Scapula-humeral tightness Shoulder adduction	blocks trunk stability; affects accessory muscles of respiration thus limits graded throacic respiration	shoulder evaluation or poor neck elongation so increased hypernasality	restricts oral movement	limits ability to reach, investigate, move arms/hands and so limits object permenance, circular reactions, tool use, functional play, etc.	could makedly restrict use of manual sign and hand/arm movements for communication board and writing
Anterior pelvic tilt Posterior pelvic tilt	blocks abdominal muscles develop-ment and thus graded movement of abdominals necessary for graded and pro-longed respiratory support for speech	compensations can develop and cause trunk and neck, head, mouth, fixing that affect poor oral-speech patterns.		limits active inter-action with environ-ment. Child does not experience movement, and various postions so spartial concepts could be poor.	makes good upright positioning for seating difficult, so difficult to use communication board. Compensations result in upper extremities and so again poor point, etc. is a potential problem.

(NDTA, 1980)

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Patterns of Movement	Full Body Structures	Muscle Groups	Speech Structores and/or Functions Affected	Speech Muscle Group Affected
Head Control (Captial flexion/neck elongation)	head, neck, cervical spine	Sternocleidomastoid Trapezus Hyoids Levator Scapulae Scalenus	Manadible Pharynx Lips Hyoid Bone Tongue Head/Neck Palate Larynx	Extrinsic muscles tongue; Hyoid muscles Digastric, S.C.M. Palatal muscles
Shoulder Stability/control (weight bearing, shifting, etc.)	Shoulder = clavicle, humerus, scapula	Deltoid Pectoralis Major/ Minor Latissimus Dorsi Trapezius Rhomboids Levator Scapulae Serratus Anterior	Ribs, Spine Should Girdle: Function: Evaluation and Lowering of Ribs	Accessory muscles inspiration: Latissimus Dorsi Pectoralis Scalerus Serratus anterior posterior superior
Trunk Control (Balance of flexion/extension, lateral flexion, etc.	Spine, ribs, (cervical, thoracic lumbar, sacral, coccyx)	Serratus Posterior Splenius Erector Spinai Internal and External Intercostals	Function: Primary muscles of inspriation	External Intercostals Diaphram
Pelvic stability (Balance reactions, etc.)	Pelvis, femur	Rectus Abdominis Internal and External Obliques Transverse Abdominis Internal Intercostals Iliopsoas Gluteal muscles Hamstrings Quads	Function: Fix thorax against diaphram and compress adbominal wall Draws ribs and sternum down Aid in compression of adbomen; stabilize thorax; More active during forced expiration, grading muscles.	Obliques (Internal External) Rectus Adbominis Transverse Abdominal "Primary muscles expiration"

(NDTA, 1980)

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WHAT DO CHILDREN SAY AND UNDERSTAND - AND WHEN?

DOES	SAYS	SPEECH SOUNDS
INFANTS (0-12 months)		
listens to sounds	cry	
looks for sounds	make pleasure sounds	
turns to mom's voice	vegitative sounds (sneeze,	
turns when called	burp, etc.)	
responds to environmental sounds	"goo"	
responds to gestures	"air sounds", squeal babble	
	(bababa) (mama) (dada) (aba da ga)	
	gibberish - jargon (almost as if	
	child is using sentences)	
babbling + feeding = speech		
babies "output" + parent's	interpretation = language	
TODDLERS (1-2 1/2 years)		
1. follows simple directions	Single words	Uses many sounds especially
2. shows items	(body parts, clothes,	m,b,w,p,t,d,n. Sometimes
3. understands "where"	foods, toys, people,	leaves sounds out.
4. understands "who"	household objects, animals)	
5. understands "what"		
6. understands "don't"	Early combinations	
7. says "Hi", "Bye"	more = ___ (more cookies)	
	no + ___ (no go!)	
	my + ___ (my shoe)	
	adjective _____ (big ball)	
	that + ___ (that ball)	
	person + action (mommy eat)	
	action + thing (eat cookie)	
	place + object (dog chair)	

DOES	SAYS	SPEECH SOUNDS
3 YEARS		
understands: one, more, all; function of items Who is ___ ing? Which do you want? or What do you do when ___? in on, under, long/short	Uses 4 word sentences. Yes/no. Talks about things. Uses plurals. Uses ing. Uses some past tense. Tells full name.	Uses most speech sounds. Harder sounds begin to develop: s,z,sh,k,g,ch,j,/^/
4 YEARS		
Prepositions Colors How many Counts fast/slow hard/soft When How are you How did you Remembers 2-3 part commands rough/smooth	Sentences 5-7 words on the average. Uses language and sentences much more like adults.	Uses most speech sounds WELL.
5 - 6 Years		
Coins right/left function of items use of body parts comparatives (est) counts well May know some simple addition. Can recall members of a category. Morning vs. afternoon Can reason out an answer.	Vocabulary continually increases and sentences become more complex.	

Compiled by: Jane E. O'Regan Kleinert, MSPA/CCC (1978)

		CLINICIAN	PROCESS	CHILD	RESPONSE NOTES
I. MATCHING and SORTING					
Selects identical and similar objects and pictures.	A.	Shows object.	O-O	Selects identical object of 2-3 choices.	
	B.	Shows object.	O-O	Selects similar object of 2-3 choices.	
	C.	Shows picture.	P-O	Selects similar object of 2-3 choices.	
	D.	Shows pictures.	P-P	Selects similar object of 2-3 choices.	
	E.	Shows pictures.	P-P	Selects similar picture of 2-3 choices.	
II. IDENTIFICATION and LABELING					
Finds, matches, sorts, labels, and describes single items, vocabulary items might include nouns in a developmental order as follows: people, body, parts, clothes, foods, toys, household items, transportation vehicles, utensils occupations, etc.	A.	Where's the (label)?	V-O	Selects named object.	
	B.	What is this? Who is that?	V-V	Labels (names) object.	
	C.	Find the one that (Function).	V-O	Selects object by function.	
	D.	Find the one that's (characteristic).	V-O	Selects object by characheristic.	
	E.	What is ___ for? What do you do with _____?	V-V	Describes object's function.	
QUESTION FORMS: SHOULD INCLUDE: What, Where, Who, What is ___, for, Why When	F.	Who do you call if ___?	V-O	Selects person.	
	G.	What do you need if _____?	V-O	Selects item.	
	H.	Why/When do you call a ___?	V-V	Describes function of person.	
	I.	Why/When do you cal a _____?	V-V	Desribes function of object.	

O = object, P = picture, V = verbal

		CLINICIAN	PROCESS	CHILD	RESPONSE NOTES
III. CATEGORIZATION					
Items in the same catagory are related by function	A.	Find all the (Category name)	V-O	Finds items by catergory.	
or Characteristic (e.g., transportation vehicles, buildings, eating utensils, clothing, people, body parts, animals, writing utensils, etc.	B.	Find all the ones that (function).	V-O	Finds items by function.	
	C.	Which ones go together?	V-O	Puts together items within a category.	
	D.	Which one doesn't belong?	V-O	Puts aside item that doesn't belong in the category.	
	E.	Which one is not a (category name)?	V-O	Puts aside item that doesn't belong in a category.	
	F.	Why did you put those together?	V-V	Describes/labels category.	
	G.	Why doesn't this go with the rest?	V-V	Describe negative relationship to category.	
IV. CLASSIFICATION	A.	Select item	O-O	Selects items.	
	B.	Find all the (class names).	V-O	Finds items in class.	
	C.	Which ones go together?	V-O	Finds items in class.	
	D.	Which one doesn't belong?	V-O	Puts aside item that doesn't belong in class.	
	E.	Why do these go together?	V-V	Names or describes class.	
	F.	Why don't these go together?	V-V	Names two classes or tells how one belongs in class and other doesn't.	

CLASSROOM TEACHER'S OBSERVATIONAL ASSESSMENT OF COMMUNICATION SKILLS

Part I: General Description of Communicative Behavior - Pragmatic Analysis:

I. Determination of Level of Communicative Development

A. Perlocution: undifferentiated motor or vocal expression
B. Illocution: regularized expression through vocal or motor modes
C. Locution: language making level (vocabulary, syntax and semantic development begins)

II. Speech or Performative Acts

A. Imperative - demands
B. Declarative - attention getting
C. Request - expressing wants
D. Interrogative - questions or seeking information
E. Greeting
F. Share/Show
G. Express Emotion
H. Answer
I. Humor, etc.
J. Negation: refuse, reject, denial

III. Type of Verbal/Communicative Behavior

A. Initiation - begins a communication
B. Imitation - complete or partial repetition of another's action, vocalization, or verbalization
C. Response - vocal, verbal or motor response to another's communication
D. Do environments afford the opportunity to:
   1. Initiate
   2. Imitate
   3. Respond

IV. Primary Mode of Communication

A. Receptive - understanding of incoming information
   1. Tactile
   2. Visual
   3. Auditory
   4. Tactile-Visual
   5. Tactile-Auditory
   6. Visual-Auditory
   7. Tactile-Visual-Auditory
   8. Any combination of the above

B. Expressive - type of output child uses to communicate:
   1. Motor - gesture, banging, grabbing, pointing etc.
   2. Vocal - squeal, scream, cry, jargon (type)
   3. Motor-Vocal
   4. Motor-Vocal-Verbal
   5. Motor-Verbal
   6. Verbal - Type: echo, perseverative speech, meaningful/selfinitiated speech

V. Turn-Taking - Child understands the give and take sequence of communication

A. Vocal contagion
B. Mutual imitation
C. Spontaneous imitation
D. Imitation within repertoire
E. Unique repertoire
F. Question - Answer (T-C)
G. Question - Answer (C-T)
H. Maintains a conversation

VI. Awareness of context postulate

A. Echo - inappropriate to context
B. Rote or patterned response or imitation inappropriate to context
C. Echo appropriate to stimulus but not self-initiated
D. Rote or patterned response or imitation appropriate to stimulus
E. "Surface" level response - appropriate to stimulus - turn taking or place holding which may well be sufficient to communication needs of a situation
F. Communication which indicates individual senses another's obvious feelings, concerns, needs etc.
G. Communication which indicates individual senses subtleties of a situation or context

Part 2: Pragmatic Evaluation at the Locutionary Level* (Bates & Johnston, 1977):

I. Conversational Postulates

A. Adherence to Relevance Postulates, i.e. Does child follow topics?
   1. Wants to communicate
   2. Changes topics frequently and does not follow topic leads
   3. Maintains topic
   4. Explicity marks topic changes
   5. Quantifications of above

B. Adherence to Belief Postulate: Is child believable? - If not, why not?
   1. Child is unreliable informant
   2. Child is reliable informant
   3. Child uses sarcasm, irony
   4. Qualitative judgments of above

C. Adherence to Amount of Information Postulate: use of Ellipsis (conversational omission of major sentence constituents) - Does child assume too much knowledge on the part of his listener?
   1. Ellipsis both in initiation and response turns
   2. Ellipsis primarily in response turns
   3. Ellipsis is interpretable on the basis of physical setting, prior discourse or shared knowledge; child provides listener with only and all needed information
   4. Quantifications of above

II. Use of Forms with Particular Pragmatic Relevance - Does child understand subtle meanings behind the following:

A. Definite and indefinite articles and adjectives: (e.g., a, the, that, those, these, same)
   1. Does child use these forms?
   2. Does child use forms appropriately?
   3. Does child use forms contrastively?
   4. Quantification of above

B. Pronouns: (e.g., this, that, it, personal pronouns, etc.)
   1. Does child use these forms?
   2. Does child use forms in appropriate discourse context?
   3. Does child use forms contrastively?
   4. Quantification of above

C. Relative clauses and prenominal adjectives
   1. Child uses relative clauses and adjectives
   2. Child uses these in appropriate discourse contests
   3. Quantification of above

D. Contrastive stress - voice inflections
   1. Child uses contrastive stress
   2. Child uses contrastive stress associated with grammatical "errors"
   3. Contrastive stress is interpretible (i.e., contrasting element established in physical setting prior to discourse or shared knowledge)
   4. Quantification of percent interpretible (of each type)

E. Explicit discourse connectives (e.g., and, then, now, but, also, even, so, yet)
   1. Uses conjunctives and adverbs in their performative function
   2. Use of connectives is appropriate
   3. Quantification of above

III. Speech Acts - at a language-making level

A. Major functions
   1. Imperative
   2. Declarative
   3. Quantification of above

B. Acknowledgements (e.g., mmhmm, uhu, ok, yeh) - Does child use these meaningfully or just to take his "turn," processing?
   1. Does not use acknowledgements
   2. Uses acknowledgements only in response to questions or requests
   3. Uses acknowledgements while partner is talking in response to declaratives
   4. Quantification of above

C. Placeholders (e.g., well, uuuuh, ummmm)
   1. Uses placeholders non-meaningfully
   2. Uses placeholders meaningfully
   3. Quantification of above

IV. Socialinguistic Sensitivity (polite language)

A. "Please" or softening intonation in repeated requests, diminutives in requests
B. Stereotyped question requests
C. Use of past tense and/or modals in questions
D. Non-stereotyped hints and oblique comments

*Scaled in order of ascending competency

Part I compiled by Jane O'Regan Kleinert, C.C.C. and Pamela Rosenwinkel, C.C.C.(May, 1978). Joint Early Education for Preschool Handicapped, Institute for Child Behavior and Development, University of Illinois, Urbana, Illinois.

Part II adapted in part from E. Bates & J.. Johnston (November, 1977), Annual ASHA Convention, Chicago, Illinois.

TERMINOLOGY

1. Abduction - movement of limbs away from midline.
2. Adduction - movement of limbs towards midline.
3. Associated Reaction - increase of stiffness in extremities resulting from effort.
4. Ataxic - a type of cerebral palsy in which there is minimal to no balance, movements are jerky and unsteady, poorly timed, graded and directed.
5. Athetoid - a type of cerebral palsy in which the child has uncontrolled and unwanted movements characterized by fluctuating high tone to low tone.
6. Contralateral - opposite side of the body.
7. Diplegia - the distribution of cerebral palsy manifested in 2 extremities, usually the lower extremities.
8. Dorsiflexion - movement of the foot up and towards the anterior surface of the leg.
9. Extension - straightening a part.
10. Flexion - bending a part.
11. Head righting - head moves toward vertical position in relation to gravity.
12. Hemiplegia - the distribution of cerebral palsy manifested in one half of the body.
13. Hypertonic - greater than normal tone.
14. Hypotonic - less than normal tone.
15. Prone - lying on stomach.
16. Plantarflexion - movement of the foot down and towards the posterior surface of leg.
17. Quadaplegia - the distribution of cerebral palsy manifested in all 4 extremities.
18. Rotation - movement taking place around an axis.
19. Supine - lying on back.
20. Tone - amount of contractible response of the muscle when passively lengthened.
21. Trunk righting - movement of the trunk to bring the center of gravity over the base of support.

Compiled by: D. Wilhite (1982)

INTERVENTION STRATEGIES

Jane O'Regan Kleinert, M.S.P.A., C.C.C.

INTERVENTION STRATEGIES

Jane O'Regan Kleinert, M.S.P.A., C.C.C.

I. Summarizing the Assessment Data

A. Intents and Forms: List any and all expressions of intent and form through which communication is expressed. Some examples might be:

Intent	List Intents	Forms (description of observable behaviors or output of the student)
Present? or Absent? (circle one)	1. Affirmation	Smile
	2. Negation	Push away
	3. Declarative (gain attention/call)	Squeal and look at teacher
	4. Request	Takes mom's hand and goes to fridge
	5. Reply	Points to correct item when asked "Where is the cup?"
	6. Refusal (Protest)	"Na na" and arches back when does not want to do an activity.
	7. Greeting	"Ha ha" and waves
	8. Demand	Throws glasses and reaches for objects during snack time and circle time.

Look at each example on the previous page.
Do you think the above behaviors, as described via possible intents and forms, indicate that intent was present/absent on the part of the student?

Intent	Possible interpretation	Forms (output)
Is Present Or Absent (circle one)	1. When smells food BUT behaviors do not appear to be directed to anyone	Smiles, rocks, squeals, moves body
	2. when diaper is wet	Cries
	3. random?	Bangs on lap tray often
	4. unknown	Rocks, hums, rubs hands on carpet
	5. unknown	Babbles "ma ma", "dididi", "ga"
	6. unknown, possibly pleasure	Claps hands

Look at each example above. Do you think the above behaviors as described via possible intents and forms indicate that intent was present/absent on the part of the student? Which ones require further investigation?

B. What situations, sensory input, persons, activities, and/or environments elicited the following, and in what manner (observable behavior)?

What was the student's behavioral state prior to stimulation? Was he/she asleep (deep vs. light sleep); drowsy; quiet-alert, active-alert; crying, agitated (e.g. screaming, thrashing)? Then describe what happened when and after he/she became more alert or exhibited more sophisticated interactive behaviors.

Example: Description of Initial Behavioral State

Sensory input which elicited:

Alertness	Awareness	Engagement	Anticipation
opens eyes when picked up and sung to	moves head, arms, when mom talks to him, or a tape of mom's voice is played.	looks at teacher when in supine with chin tuck and slowly rocked side to side; lost engagement when activity stopped or rate of movement was too slow	looked toward, food when he hears spoon in dish, or when he smells food gets obviously excited, and vocalizes.

Imitation	Initiation	Response
Performed mutual imitation of vocalization with peer on playground after rhythmic swinging in an adapted swing	Kicks in chair and comes forward to affirm for "more" when mom or teacher are feeding him, then stop and wait for him to initiate	Looks to candy bar on board when teacher asks "What do you want to buy for snack at break today?"

C. **Make a decision regarding what level of performative/communicative acts are being used by this student to communicate.**

perlocution

illocution

locution

D. **Receptive Abilities and Input Modes:** Determine at what level of receptive abilities the student is functioning and what modes of input are the best for the student (single or combined modalities), and which are the least effective.

Sensory Mode	Most Effective	Least Effective
auditory visual tactile (touch) movement smell taste	For example: Describe here the characteristics of the selected mode(s) of input e.g. giving commands via auditory, slow melodic, sing-song speech coupled with slow, back and forth rocking (multi-sensory), etc. Gestural input (natural gestures) plus short, regularly inflected commands and tactile cueing with deep touch or pressure (multi-sensory) Give commands with simple black/white line drawings on cards alone, NO verbalization (single mode)	Describe types of input that were the least useful OR the most distracting

E. Level of socially interactive behaviors with "speakers" and type of sensory stimuli which elicited such interactions.

Level of interactive	Average length of interaction	What began the interaction?	What ended the interaction?	Behavioral description
alertness				
awareness				
engagement, localization, tracking, etc.				
anticipation				
contagion				
mutual imitation				
echolalia				
spontaneous imitation within repertoire				
spontaneous imitation of novel stimuli				
response to words/commands				
response to questions				
initiations to others				

F. List the highest level (most sophisticated) output observed:

1. receptive response
2. expressive output

G. Description of locutionary output (if present):

1. System used: verbal, sign, communication board (describe augmentative system used), print, braille, etc.
2. Vocabulary used
3. Length of utterance
4. Basic semantic relations used
5. Syntax used
6. Pragmatic descriptions of student's output (See Assessment Module for details.)

H. Results of any formalized testing (list information):

I. Interfering Systems:

Systems	Deficits	Effect on Student's Abilities
Motor	For example: increased muscle tone, associated reactions	decreased interaction with the environment decreased vocalization decreased eye contact decreased active body movement can not make clear decisions regarding student's abilities by use of most formalized tests of cognition, language, academics due to lack of output/communication/ response system.
Sensory	visual impairment, tactile defensiveness	

J. Which team members must be involved in order to facilitate evaluation and programming in spite of interfering systems? (list here)

K. Other areas of need:

1. feeding
2. respiration/phonation
3. voice
4. prosody
5. hearing acuity
6. auditory processing
7. visual acuity
8. tactile defensiveness
9. medical issues (e.g. seizures)
10. emotional problems
11. other
12. positioning/seating

L. Follow-up necessary: (as required due to information in H, I, J, and K above)

II. The Environmental Catalog

	Vocabulary needed:		**Communicative Intents to be used:**
Domain	receptive	expressive	intent form
Domestic			
Community			
Vocational			
Leisure			

Note specific settings or situations within domains where communication programming is needed, such as classroom, bus, home, PT/OT, lunch, break time, play, peer interactions, community-based instruction. List these within the proper domains and select receptive/expressive communication goals and vocabulary needed for each to complete the format on the previous page. Work with the family, teacher, and others to complete such goal selection.

	Expected			
	Input	**Output**	**Specialists Needed**	**Teaching Strategies**
Example: domestic	includes sensory input, directions, position of materials and of student adaptive equip-ment, etc. necessary to teach student to respond for goal X	includes mode (e.g. verbal, gestural, augmentative system use, etc.) position of student and material adaptive devices, etc. needed for student to express himself/herself	Teacher, OT, PT Speech-Language Pathologist,	(see remainder of this module)

The above chart becomes the planning worksheet for I.E.P. goal selection as well as the worksheet for programming specific strategies. The remainder of this module involves descriptions of proposed strategies and examples of treatment procedures for students functioning at perlocutionary, illocutionary, and locutionary levels of communication.

III. THE PERLOCUTIONARY LEVEL - INTERVENTION

Caution: Be careful when using the term "perlocution" because, specific "preparation" activities must be provided to students with severe physical and multiple handicaps. Often such students have intentional behaviors, but these are masked by the student's severe physical or sensory problems.

A. Interfering Systems Can Mask Receptive/Expressive Abilities:

Interfering systems such as sensory deficits, muscle tone disorders, etc. can mask receptive/expressive abilities. Consult appropriate specialists in the areas of deficits before making statements about a student's overall cognitive, language, and communicative functioning levels. Joint or team evaluations including OT, PT, parents, etc. are usually necessary to obtain the most accurate results.

Example 1: John, age 13 months, had severe spastic cerebral palsy and had almost no movement in extremities. He responded with markedly increased muscle tone, tactile defensiveness, and asymmetrical patterns of movement when even touched. An evaluation conducted by the home trainer from an early intervention program tested John using a developmental scale, which yielded cognitive and language functioning at 2 months.

An arena assessment was completed a few weeks later with an occupational therapist, physical therapist, speech-language pathologist, and educator present. Following several minutes of handling to help normalize muscle tone by the physical therapist and handling and positioning by the OT and PT to maximize John's motor output, a developmental test was again administered. This time, because the child was now able to gaze; track; use his hands/arms to reach, grasp, and interact with objects; move head side to side; to localize; and functional skills were found to be at an 11 months level.

Example 2: Tina, age 6 years, showed no active movements in her body other than eyes opening and closing. She was reported to be deaf-blind. After handling to reduce her muscle tone, improve respiration and provide oral tactile input during a feeding program, Tina quickly progressed from a consistent sleepy or "drowsy" state to the ability (over time) to obtain eye contact, some minimal head control, localize to her mother's voice and use her legs to perform primary circular reactions. It is beyond the scope of this manual to provide any detailed suggestions regarding movement, positioning, handling, tactile input, etc. for students with profound physical and multiple disabilities. However the speech-language pathologist must be aware that specialists in the field of pediatric physical and occupational therapist and NDT trained speech pathologists may be able to provide assistance in working with such students. Often, lack of such input results in the speech-language pathologist making a decision not to treat such a child because he/she is "too severely impaired".

B. "Cognitive" Functioning:

Though certain early cognitive skills (such as object permanence, tool use, symbolic play, etc.) may be necessary for use of a standardized (locutionary level) communication system (such as sign, verbalizations, communication boards, etc.), many children who function below the 9 months level developmentally can produce output to alter a situation, or a person's actions (can communicate at some level).

To wait for certain "cognitive skills" to be firmly established before beginning any form of communication programming may well penalize students who could communicate at more "primitive" levels.

Example 3: Bob was 8 years old and had severe visual impairments and severe physical handicaps (weighing about 20 lbs., showed almost no body movement except for rolling head side to side, eating, and vocalizing "randomly"). Systematic sampling revealed, however, that Bob vocalized with some consistency when he smelled food for lunch being brought into the room. The teachers were asked to hold each spoonful of food by Bob's nose prior to feeding him and wait for him to vocalize during lunch while saying " Bob, do you want to eat? Tell me (more)." They then waited for Bob to vocalize and fed him. Within 2 months Bob would vocalize spontaneously for "more food" at lunch without the smell stimulation.

C. "Poor" Listeners:

Students who communicate in nonstandard but regularized forms are often communicating, but the receivers or listeners do not assess the student's output in a systematic way and therefore miss the fact that the child is trying to express communicative intent. Parents, who know their children the best of anyone, are the most likely to understand their child's communication. Therapists/teachers who are not yet familiar with the student often miss these communications, however.

Example: A two and one-half year old child who had athetoid cerebral palsy with spasticity, cried and screamed the entirety of her 45 minute sessions with the PT and teacher for a period of months. The speech-language pathologist systematically observed the child's behavior and noted that she was quiet and attentive when her mother was in the room; and screamed, rocked, and said "mmm" when mother left. This output had been viewed as a behavioral problem by the program staff. The speech pathologist upon meeting the child showed her the sign for "mother" and then allowed the mother to enter the room. When mother left again the child was told that she was to work for "just a few minutes" before mother returned. After working a short time cooperatively, the child began to cry again. She was told "Tell me what you want." The child signed "mother," mother entered, kissed her and left. Work periods were gradually increased in length until the child could participate in class sessions for 45 minutes without crying or screaming. Other early signs introduced were "no" to allow the child refusal in a standard manner, and "want" to allow the child to have some control over the environment via a standardized communication system. A combination of sign and communication boards were developed over time, while the speech\language pathologist (SLP) also worked toward development of oral speech. By age 6 oral speech was emerging. Today, at age 14, the student is a totally oral communicator.

IV. GOALS AND STRATEGIES FOR STUDENTS WHO APPEAR TO BE AT A PERLOCUTIONARY LEVEL OF COMMUNICATION

Goal 1: Shaping Perlocutionary Output Toward more Sophisticated Levels of Communication (Illocution)

Strategy A. Bring "random" output under stimulus control in functional daily activities in order to approximate the expression of some form of communicative intent.

Example: Brad, following a head injury, was nonverbal, nonambulatory, had paralysis in the left side of his body, vocalized randomly, and was visually impaired. He banged on the lap board of his wheelchair frequently and randomly. The communication strategy suggested was as follows. A light touch switch was placed on the chair which activated music and tapes of his mother's voice. Data indicated that Brad regularly searched for the switch and held his hand there when the music or voice came on. If the switch was unattached, the hand banging returned to a random level. Over time, the music tapes were changed to endless tape loops. One tape said "Mom, come here," to which mother responded by coming to him with a hug and a kiss. The other tape, which was covered with a different texture than the first for discrimination purposes (due to his visual impairment), said "More please." This tape was used during feeding. When he "requested" more, he received another bite. Vocalizations often accompanied such activities and Brad gradually (over a period of several months) requested "mom" and "more" verbally.

Strategy B. Assuming Meaning: Infants learn the value of verbal/vocal output, etc. because parents naturally interpret the infant's cries, laughs, babbling etc. as meaningful (e.g. mom comes when baby cries and says "Oh, you're hungry, here's your bottle"; or each time baby says "dada" Dad glows and runs to baby saying - "Oh, you called daddy"; the parents "assume" this output to be meaningful). The child is reinforced for output in the natural environment by having his/her needs met whether or not intention has actually developed. This is a very effective treatment technique with students functioning at a perlocutionary level.

Example: Bob, whom we have already discussed in an above example, was observed to vocalize more in the presence of the voice of the head teacher. The teacher was asked to call Bob's name loudly before she came to change his position or activity, or before transition times in the classroom day. If Bob vocalized when his name was called, the head teacher came over, touched him and said "You called me. Here I am. It's time to do X". Thus, she "assumed meaning" to the student's vocal output. Teachers were requested to respond to Bob's vocalizations as if he were calling for attention. When he vocalized audibly and for at least 2 seconds, a teacher would approach him saying "Bob, I heard you call me. Here I am." Sampling showed that within 2-3 months Bob moved his head when his name was called and vocalized to "call" the teacher when she said "Bob, its your turn. Call me." Additionally, he began to vocalize to request her attention quite regularly whenever she was near and

even became somewhat of a "behavior problem" due to his frequent requests for attention! This indicated his increased alertness, attending, social awareness, and emerging attempts at illocutionary output.

Strategy C. Use highly reinforcing activities to elicit some form of request, response, or at least early imitation within repertoire. Such activities as rocking, moving on an object, bouncing, tactile input, etc. are very reinforcing for some students. Note: consult OT/PT before use of such techniques as they can effect muscle tone, balance, etc. in positive OR negative ways if used indiscriminately. Students even at quite low levels of cognitive functioning often try to continue the movement or pleasurable activity after the teacher/parent stops the input. When we assume that such output is meaningful, it can be used as an early request for recurrence or "more".

Example: Loretta, a 12 year old girl with moderate motor deficits, blindness, and severe/profound handicaps, greatly enjoyed movement activities if in a secure/stabilized position. The OT and SLP gave such input and then stopped and waited. Loretta would occasionally vocalize and continue to rock herself after a few seconds. This was interpreted as a request for "more." Loretta gradually used her movements and vocalization to request "more" of this pleasant activity on a consistent basis. See case study # 1 in Appendix D for more examples.

Strategy D. Adapt tool use and cause and effect strategies to communication. Teach the child or student to use his/her output to control the environment (note examples above), or to use the "adult" as a tool. Babies around 9 months of age begin to use their eyes and vocalizations to request. If they see a cracker that they want, they will often vocalize and look at the cracker, then at mom, and then back to the cracker, indicating they are beginning to understand that they can use their expressive output to request and get a desired end, and that adults can be used as a tool to an end.

Example: Ryan is a 5 year old child with motor, cognitive, and communication deficits. He goes to the fridge and bangs on the door when he is hungry. His mother will come and stand close to him until he accidentally touches her hand when banging. She then puts his hand on hers and opens the door. He gradually has learned to take her hand and go to the fridge to request food. See case studies # 1, 3, and 4 in Appendix D for more examples.

NOTE: The following set of goals and strategies are designed for students who are believed to be functioning as a profound level of disability.

Goal 2: Improve Alertness State

Consult PT, OT, special educators, and parents regarding what techniques have been noted to set the most alert state for a particular student. Physical therapist can provide input regarding handling and positioning to normalize muscle tone, maximize controlled stability of the body, and controlled mobility for volitional movement.

Occupational therapists can provide input regarding the provision of safe sensory, tactile, and movement input. Special educators can provide input regarding the sequence of sensory input, and monitoring techniques to support successful changes in alertness state. Parents can provide information about environmental stimuli at home that really "turns their child on!"

Goal 3: Improve Awareness State

While employing the above suggestions, record what behavior changes occur to support the observation that the student is more alert and aware of his/her environment. Secure consultation from special education regarding data collection for this purpose. Inquire about "academic" goals or functional situations in which the student is to use his/her awareness and higher level sensory response skills.

Example (Auditory Input Response): The special educator wants student to be able to alert to and be aware of voices in the environment, and finally to localize to the voice so he/she can attend to or be aware of speakers in the general community when involved in community-based instruction activities. The classic goal may be "localization to sound". However, the innovative strategy would not include the student "turning head to a bell" (as is so often seen in traditional assessment and intervention strategies, and which lacks any functional use). Rather, intervention would include using the parent's or teacher's voice (taped or real) that utilize vocal characteristics found in assessment that are the most alerting to the student. Other strategies include localizing to his/her favorite type of auditory input (rock or country music, etc.; dependent upon parent's input from home) and coupling sound with touch (if multisensory input was indicated or touch localization was stronger than auditory localization). Functional transfer would then occur in the community (e.g. peers or siblings calling the student using vocal characteristics determined to be most alerting; student learning to localize to a voice in a fast food restaurant when asked "May I help you?"). Localization to voice can quickly be coupled with the strategy of "assuming meaning" to the student's alerting to and localizing to sound. We "interpret" his/her output as response to our input, and we respond in kind. See case study # 1 in Appendix D for more examples.

NOTE: Be ready to couple/combine strategies when needed for more successful intervention.

Goal 4: Increase Engagement Skills

Consult with special educators regarding goal areas into which such skills will be integrated: for example, peer interaction activities. Provide program suggestions drawn from evaluation data regarding best input modes which facilitate gaze at another person; shared gaze or shared attending with each other; focusing on an object, eye contact; line of regard behaviors, (this occurs when adult and student are both attending visually to the same stimuli, the adult then shifts visual attending to another stimuli and if the student follows the adult's gaze, the student is considered to

have "line of regard"); localization; and shared referencing. Provide suggestions regarding what stimuli or situation maintained engagement behaviors, promoted tolerance or physical contact, etc. Be present during peer interactions to help in setting up situations that create the appropriate sensory input to elicit and maintain engagement: e.g. voice, pitch, inflection, melody, gestures, tactile cues or input, body position of student, the peer that fosters best eye contact, etc. Be creative regarding the selection of stimuli that will interest both student and his/her peers. For example, if the student shares visual referents when stimuli has lights and movement, select toys that have these qualities (e.g., remote control police cars with red lights and movement). This will entice both student and peer. If auditory input is also beneficial, select a car that also has a siren, for example. Such toys have a high reinforcement value to children without disabilities as well. These toys are also easily adaptable for switch use. The student may learn to activate the switch/toy and thus, facilitate development of tool use. See case studies # 1, 2, and 3 in Appendix D for more examples.

Goal 5: Improve Auditory "Processing" of Sound at Basic Levels.

These include awareness of, attending to, and localization to sound, voice, music, etc. Another target for a student functioning at higher levels is active searching for the source of sounds in the environment and then identifying sounds in the environment and responding to them appropriately. Obtain consultation from a PT or OT if needed regarding best positions for the above activities with a particular student who has significant motor disabilities and muscle tone problems. For example, what is the best body position(s) to foster face to face interactions or eye contact? What position(s) foster some stability for the head so it can be turned from side to side for localization activities?

Strategies: See case studies # 1, 2, and 3 in Appendix D for descriptions of various examples of auditory stimulation.

Goal 6: Increase Use of Directed Eye Gaze
(to foster engagement, shared referents, and eye pointing at a future time as students develops more skills)

Strategies:*

A. Rule out (or in) a disregard for right, left, or central areas of the visual field. (Consultation with a medical and educational specialist in vision may be necessary if there is any question about vision deficits.)

B. Determine if the student tracks horizontally or vertically. How much in each direction?

C. Determine if the student shares focus on items, etc.

D. Determine if the student has a "line of regard."

E. Does the student look and find a noisy item dropped on his/her chest or body? (Visual plus tactile input)

F. Does the student look for and find an item hidden on himself? (Visual plus tactile input)

G. Does the student find toy or item on another person?

H. Does the student find item/toy obviously present, partially seen, and invisible (fully hidden)?

I. In what position does the student focus best? prone? supine? sidelying? sitting? standing? (Consult OT/PT)

J. What are the student's ranges in these positions? (Consult OT/PT)

K. Does the student use a 3-point gaze: looks to adult, then to the desired item, and then back to the adult?

L. If the adult talks about an item or person, does the student look at the person or thing in "response" or acknowledgement of the speaker?

M. Can the student look to a specified point? How far away? (e.g. "Find X", or "Where's X?")

N. Can the student follow pointing as directed by another person?

O. Can the student use an "eye point" to indicate wants? Can he do so in a two-choice situation, on an E-Tran?

* Adapted in part from Page & Steckol (1988).

Goal 7: Establish Shared Attending and Shared Referents.

This is one of the very basic needs for communication between two people. Important skills include awareness of other people and objects in the environment, and engagement skills. Stimulate these as noted previously in Goals 2-6. Other helpful strategies might include "prattle and play" as described by Carlson (1982) and described in Goal 1 in the section entitled "Goals and Strategies for Eliciting Illocutionary Output..." of this module. Activities that use repetitious input, activities which include actions on objects, and sharing/showing objects to peers and adults in the environment are also excellent strategies for eliciting shared attending and shared referents.

Goal 8: Foster Cognitive Skills Which Facilitate Higher Level Communicative Output

Strategy A. Object Permanence

1. Finds attractive object/person removed from direct gaze (consider physical assistance, auditory cues, tactile/touch cues, etc.)

2. Finds partially hidden object/person (provide cues as needed, see #1 above)

3. Finds fully hidden object (provide cues as needed)

4. For students with motor impairments, use adaptation for eye gaze searching. For students with visual problems, drop noisy object on the student's body, partially hide noisy item, fully hide noisy objects, etc.

5. For motorically involved student, teacher/therapist/peer wears communication vest or object vest and goes through sequence but student indicates on vest where object is placed or hidden.

Strategy B. Circular Reactions

1. Position items that deliver sensory input in such a way so the student's "random" output activates the items: e.g. light touch switches to tape recorders of a familiar voice and/or music; a vibratory toy or moving toy, lights, TV, etc. Assessment data on what the most reinforcing stimuli are for a particular student, will determine the items to use. Does the student continue to activate the stimulus?

2. Perform Sensory Input Activities or Muscle Tone Normalization Activities: For example, this may include the OT's tactile recommendations, and/or the PT's handling recommendations to normalize muscle tone and to increase active movement and awareness of the environment. Use situations and environments where items, toys, switches (dependent upon age appropriateness and student's observed preferences) will be activated by random movements elicited by the sensory stimulation and increased active movement techniques suggested by OT/PT.

Tina, age 6, was functioning in a profoundly delayed range of cognitive and motor functioning. Vision and hearing were both questioned. Almost no active movements were ever observed other than eyes opening and closing. When physical therapist, occupational therapist or NDT trained speech pathologist performed safe tactile and movement input and handling procedures to normalize muscle tone, elicit head control, and improve respiration patterns, the student could focus visually on the speakers, localize to mother's voice calling Tina's name on the left side. Tina also

began to randomly kick one leg. A movement sensitive toy which played music when knocked over was placed close to Tina's foot. When she began to kick her feet during handling activities, the toy was activated. This reinforced primary circulary reactions in this student who previously evidenced almost no active output or social interactions. Gradually the toy was replaced by a touch sensative plate switch which activated a tape recorder with music; and finally, an endless tape loop to call mom.

Strategy C. Increase Active Interaction with the Environment and Actions on Objects (functional use of objects)

1. If student has physical disabilities, use adaptive/assistive devices as needed for accessing items (e.g. velcro glove that picks up items if student does not have grasp, thus allowing student to look at, hold, bang, shake, mouth [if age appropriate], various objects according to their sensory characteristics.) Use PT recommendations to facilitate movement in the environment so that the student can investigate and interact with his/her surroundings. Is there any adaptive movement or mobility device the student could use to get around his/her environment? NOTE: Physical therapist must consult on such a decision.

2. Work toward functional use of items in natural, daily settings and routines. Utilize adaptive/assistive devices as needed to allow the student with physical and/or cognitive handicaps to participate in group activities in class and with peers. Select items not only on availability, but on the most likely possibility that such item will be seen and used by or with the student at least DAILY. Activity-based instruction is an excellent classroom technique for this. See case studies # 1, 2, 3, and 4 in Appendix D for more examples. Activity-based instruction greatly facilitates functional, natural usage in daily settings and allows students of various levels and abilities to interact together in daily activities.

Strategy D. Facilitate Tool Use

1. Place a light touch switch attached to a toy, appliance or tape player (with mom's voice, music, etc.; dependent upon information drawn from the evaluation data regarding most alerting and stimulating stimuli for a particular student) near the hand of the student who appears to be able to touch such a device. Can it be determined that the student is activating the switch at levels above chance? If the student often randomly hits or touches objects, there should be a decrease in this behavior and an increase in the duration of contact with the surface of the switch if that the student is in fact trying to maintain the pleasant output of the device. There should be an increase in touch or tapping behaviors on the switch (in a student who rarely interacts with surfaces), if the student is trying to maintain the pleasurable output of the device. Then, we assume that the student is gradually putting some value to

the switch as a tool to access or control the environment, or make something happen. Such strategies can gradually become communicative by making a contingency dependent upon activating the switch. For example, if the switch is attached to an endless tape loop that says "More, please," the student can be required to activate the switch to get more of a favorite activity or food. Any action, vocalization, touch, or eye gaze output by the student can be used in the same way to elicit communicative "tool use."

2. Give a particular input (e.g. movement or touch) that the student enjoys several times in a row. Then stop and wait for the student to do something to indicate that he/she wants "more" of the input. Gradually require that the student initiate that output to obtain the activity. This teaches the student that his/her output is a "communicative tool." It also teaches the student that other people are tools to use (if we communicate with them) to control our environment. See case study # 1 in Appendix D for additional examples of these strategies.

Goal 9: Improve Overall Imitation Skills and Turn-Taking Skills

Strategy A. Vocal Contagion: This is a phenomenon seen in very young infants. When the infant is placed in an environment filled with vocal output, the infant "catches it" and often begins to make sounds. For the student with severe delays, devise regularly scheduled situations in which the student is in an environment with other students or peers exhibiting much vocal or motor output. The student should be exposed to such stimuli in order to naturally encourage the student to increase vocal or motor output in some way.

Strategy B. Mutual Imitation: This output is seen in young infants, also. If the infant is vocalizing or doing a movement and the adult imitates, the infant will continue the output and often wait for the adult to "take his/her turn." In utilizing this strategy with our students, not only turn-taking and imitation are stimulated in the student with severe handicaps, but also increased awareness of other people and a beginning understanding that the student's OWN output can change the behavior of another person. See the handout entitled "General Techniques" at the end of this module for further definition of mutual imitation and review the case studies in Appendix D for examples of its usage.

Strategy C. Improve Spontaneous Imitation Within Repertoire: Young babies are much more likely to imitate an action demonstrated by another person if the action is already in their repertoire. To ask our students to do an action that they have never exhibited on their own, is asking for them to fail.

Before selecting any movement for a student with severe handicaps to imitate, the action MUST serve some USEFUL, FUNCTIONAL PURPOSE. Having a student clap his/her hands for no functional purpose, other than to see if you can teach him/her to

imitate something, provides no natural reinforcer. However, if the student needs a sign for the request "more," and the most closely he/she can approximate the standard sign is by a clap of his/her hands or touching his/her hands together, then this is a functional purpose for teaching the imitation of a hand clap. If the student has been noted to be able to raise his/her arm, this can be functional for a natural gesture or sign for indicating a request for "up" or requesting assistance or a "turn" in the classroom. The same rules hold true for older students who have not yet developed oral speech. Simply running programs for verbal or vocal imitation is not very functional. However, if the student has some control over his/her vocalizations, and also is using some other understandable form of communication, it may be useful to work on imitation of speech sounds IF they can readily be used to accompany an augumentative communication system, or to "fill in" for that system when it is not readily available or feasible to use. For example, if the student is using the bathroom and needs to indicate that he/she is finished so that he/she may be assisted to get up, what happens if a communication board or electronic device is out of reach? If the student has a particular vocalization that is his/her signal for calling (e.g. a vocalization that approximates a /d/ for "done" or /^/ for "up"), this can be used as a back-up system when needed in such situations.

Strategy D. Use of Spontaneous Imitation Of Novel Stimuli: Functionality is the important issue in selecting output for imitation of new movements, vocalizations, etc. Varying levels of physical assistance and cueing should be used as necessary. Be sure that the student can tolerate and understand tactile input if these teaching modes are selected.

Goal 10: Increase Comprehension of Simple Gestures and/or Simple Verbal Input

Strategy A. Use repetitive input done in a regularized, daily fashion during functional activities using cues needed; e.g. melodic intonation of voice, gestures, tactile cues, physical assistance and physically taking student with you during the preparation and execution of specific activities. See the case studies in Appendix D for several examples of this strategy.

Strategy B. Adaptation of Melodic Intonation Techniques: This technique can be used at all levels of communication/comprehension training. It is based upon successful therapeutic techniques used with adult stroke/aphasic patients. Your evaluation should help in determining if melodic intonation adaptations will be useful. If you can determine that a student is particularly attentive to music, a specific rhythm or beat, or to melody or a certain pitch of voice, then these may be useful in training the student to attend to and respond to verbal speech.

See the handout entitled "General Techniques" at the end of this module for a definition of this technique and review the case studies in Appendix D for examples of this technique.

Strategy C. Couple verbal plus tactile and other auditory cueing to aid in comprehension of simple directions. If a student is to go to his/her chair and sit, give the simple command and physically assist the student to the chair. BUT before physically guiding student to sit (if he/she does not do so on his/her own), tap on chair, etc. to get student to at least visually attend to or touch the chair. Gradually fade physical assist and give only verbal direction and supportive sound (tap) or touch cues (student looks at or touches chair) in order to elicit sitting from the student.

Goal 11: Increase Anticipation

Strategy A. Use sensory activities that are especially enjoyed by the student (e.g movement input, tactile activities, taste/smell, etc.) Use very specific gestures, touch, movement, and auditory stimulation (e.g. melodic intonation) in the same way each time the activity is initiated. Do several sequences of the activity. Then just do the first part of the activity, emphasizing the most salient sensory aspects. Then stop. Does the student indicate in any way that he/she knows "what's coming". Such output might include increased alertness, opening eyes more, getting excited, laughing, quieting in readiness, looking to a certain location, etc.

Strategy B. Utilize procedures in Strategy A above. After several repetitions of this procedure, alert the student that a certain activity will now be done. Does the student indicate in any way that he/she knows "what's coming". For example, looking toward the diapering area where changing takes place when told it is time to change, looking toward his/her wheelchair when told it is time to get up, etc.

Strategy C. Dolan (1987) in her presentation "Establishing An Anticipation System" provides other techniques utilizing anticipation abilities for students who are functioning closer to illocutionary and locutionary levels. It would be most beneficial to contact her for such information. Other useful papers by Dolan include "Object Shelves", "Calendar Boxes," "Transition from Objects to Pictures", "Order of Symbol Presentations", and "Choice Making Activities." Also, read "The Use of Symbol Shelves" by Silverrain (1982).

These systems focus on placing objects which are highly related to daily activities on shelves in order of occurrence. The student goes and gets (with assistance as needed) each object before each activity begins. Eventually the student anticipates the activity from the related object. The objects could also go onto an object board for expressive communication development. One further reference for such systems is "Initiating a Program for Communication Skills Development" (Writer, 1983). She terms this process "communication shelves".

V. GOALS AND STRATEGIES FOR ELICITING ILLOCUTIONARY OUTPUT AT GRADUALLY INCREASING LEVELS OF SOPHISTICATION.

Goal 1: Modify Communicative Behaviors that are Primitive or Aberrant

Modify communicative behaviors that are primitive or aberrant, which express communicative intent but are primitive or aberrant to more socially acceptably behaviors (e.g. hitting to gain attention, using tantrums to express wants). Set up situations which have been previously observed to elicit the student's current output of communicative intents and try the various strategies below to alter students' behaviors to more sophisticated forms.

Strategy A. Utilize group situations in which the student sees peers express intents in more socially acceptable forms. For example, snack time in which others ask for, point to, sign or use communications boards to request.

Strategy B. Physically assist students (gradually and systematically reducing assistance) to use more socially acceptable and gradually more regularized signals to indicate forms of intent. Do such procedures in natural, functional activities which have previously elicited the student's more primitive communicative output. Teach the student to touch or tap others for attention. Teach students with physical handicaps to use some simple form of a calling system to gain attention (e.g. an endless tape loop that says "Come here" or "Help me", a buzzer or bell). Teach the student to use a reach or extend an open palm to request.

Strategy C. Utilize "prattle" activities as described by Carlson (1982) to teach the use of a regularized form to express communication. Prattle is described as the motor or play equivalent of babbling. We know that when babies babble, they accidentally make sound combinations that approximate words. The classic example is "dada." When Dad hears that sound sequence, he reinforces the baby as if the baby had meant to say "Dada." He goes to the baby, picks him/her up and says "Oh, you called me. I'm Daddy." We can use this type or strategy with our students. Let the student "prattle" (play randomly) with the symbolic mode that he/she is most likely to use in a formalized augumentative system. This may include, photos, package labels from favorite foods, BLISS symbols, switches and endless tape loops, switches attached to toys that scan the environment (a toy train or car that runs in a line or circle around which items may be placed so that when the car stops it will be approximating the location of one of the items and making a "choice"). Switches enable students having the most severe physical handicaps to utilize prattling. When the student touches an item, stops the "scanning train" or takes one of the items or pictures, the teacher/therapist interprets this as MEANINGFUL and says "Oh, you asked for the X. Here it is." The item or food that was "chosen" is then given to the student as if the student had requested it. See examples of this technique in case study #1 in Appendix D.

Goal 2: Increase the Type and Variety of Communicative Intents.

Strategy A. Choice Making Skills: This is one of the most important and powerful tools we can give our students to communicate. It gives them both more control over their environment and increases their independence.

See the detailed description of a program for skill acquisition in "Choice Making" by Dolan (1987). Also, review the case studies in Appendix D for examples of this technique. In general we observe a students likes/dislikes; determine his/her best mode for indicating preferences (e.g. eye point, smile, switch, communication board etc.), and offer regular and repeated opportunities for choice making. This can be as simple as during lunch: have student look at two possible foods per bite. Say, "look at X; look at Y. What do you want?" Student may point, touch, look at desired item. Keep items situated in the same position each time, in student's line of vision (or touch, or smell with students having visual impairments). Other options are an affirmative/negative response. "Look, here is X; do you want X?" Student can smile, open mouth for "yes". He may activate a switch that says "yes" or "more". If the student does not want X, he/she may frown, close mouth, look away, etc.

The choice making goal can be expanded to chores, peers with whom to play, foods, leisure activities, etc. Modes for indicating wants can be whatever the student's easiest, most clear output systems.

REMEMBER: Position of student, stimulus items, speaker, etc. all play a major role in facilitating such skills with student's having physical and/or visual impairments.

Strategy B. Calling: As previously mentioned, use a buzzer system, the student's vocalizations, endless tapes loops or a switch that plays "Hey" or "Please come here" to teach student to call for help or attention. See the case studies in Appendix D for other examples.

Strategy C. Increase Requesting Behaviors: See the several strategies in the articles by Halle (1984) and Neetz et al. (1984) for excellent strategies to elicit initiations to request. Remember, the communicative form of the expression depends upon the student's current level. The strategies in these articles can be adapted to most levels of illocution and locution. Less symbolic or standardized output can be shaped to locutionary output via such strategies. These procedures will be discussed in detail in Goal 4 of this section. Remember also that what appears to be "aberrant" behavior is often a primitive request and should be MODIFIED, not extinguished.

Strategy D. Refusal/Protest: Utilize the data collected from the evaluation to determine the student's likes and dislikes (preferences). Regularly offer foods or activities that the student does not prefer. Be sure these things or activities are not truly aversive stimuli or something that will put the student under stress, etc. Foods are a very good tool to use in these situations. Observe how the student refuses a food

he/she does not like. Shape this refusal into as high a level of communication as possible. For example, if a students spits out foods that he/she does not like, shape this behavior to one that is more acceptable. Such behaviors might include a closed mouth, "push away" of the food or the adult's hand, a "na na" for "No," a head shake, or turning away of the head. The behavior chosen to be used depends upon your data from the evaluation indicating what physical abilities the student has to express his/her communicative output. If the student is at a slightly higher level, you might choose to use an endless tape loop in a tape recorder accessed by a light touch switch, which says "NO, NO, NO." Be sure to set up situations in which you are sure you can HONOR THE STUDENT'S COMMUNICATIONS (i.e. select teaching situations which allow the student to make alternate choices to the one the adult is presenting, not ones in which the student has no other options). If the student begins to generalize his/her refusals or protests to situations in which he/she must comply, (time to get coats on to go home, the bus is waiting), acknowledge the protest ("I know you don't like getting your coat on,") and explain that in this case there are no other options ("but this is something we have to do.") This is the same technique that you would use with any child who is learning the semantics and parameters of communication and language.

Strategy E. Greetings: Regularly greet students in naturally occurring situations as often as is appropriate during the day. Ask others in the environment to do the same. Persons involved in such situations might be teacher(s), other therapists, parents, the bus driver, peers, lunchroom staff, etc. Do not use contrived or repetitive strategies. Rather, arrange for people in the environment whom the student naturally meets throughout the day to greet the student in a regularized way and then to aid student to respond in a specified way. This strategy could also reinforce eye contact or localization to voice.

Strategy F. Sharing Information: In natural situations, teach the student "showing" strategies. Group situations in which the whole class is interacting together are helpful in providing models to student. Peer activities in which "typical" or nonhandicapped peers show the student different attractive items and activities that involve turn-taking (with the student receiving as much physical assistance as needed to take his/her turn at sharing/showing information) are very useful. This is a functional way to teach object identification.

Rather than sitting with the student in a repetitive 1:1 situation asking the student to "Show me the X," we can facilitate such abilities in an interactive situation with a "typical" peer. Have the peer share something with the student. Then the peer says, "Do you have an X, too? Show me the same one as mine," thus facilitating matching. At a higher level, the peer shares something with the student and then says "Do you have an X?" (a different item than has just been shared), "Show me your X," thus facilitating response to vocabulary. Be sure stimulus items are FUNCTIONAL and AGE APPROPRIATE. Finally, the peer takes his/her turn sharing an item, and waits for the student to take his/her turn by selecting something to share/show. Use gradually decreasing physical assists as needed.

Goal 3: Increase Communicative Initiations by the Student

Strategy A. Mand-Model: A traditional command and modelling procedure directed primarily by the adult (teacher/therapist, parent) and gradually faded until the student initiates the communication in a given situation (Halle, 1984).

Strategy B. Time-Delay Strategy: A procedure, as described in Halle (1984), in which situations are set up in the NATURAL ENVIRONMENT which most likely will elicit communicative output (e.g. a request) from the student. The adult (teacher, parent, SLP) presents the situation, but delays for gradually increasing periods of time and then giving a model or assistive cues to the student to offer the student a chance to initiate his/her own communication (Halle, 1984).

Strategy C. Incidental Teaching: This procedure is one in which the purpose is to incorporate newly acquired communication skills into the "flow of conversation" (or turn-taking) in the natural environment and contexts of the student's daily life. The teacher/therapist or parent arranges the environment to set up occasions for incidental language teaching in NATURAL CONTEXTS. Generalization of newly acquired skills (that we taught in more structured settings) are now transferred to more natural settings.

NOTE: Some of the above strategies can be used to teach responses and imitations as well as initiations. However, we are especially interested in teaching the student to INITIATE so that the student learns to begin to control his/her environment.

Some incidental teaching strategies to elicit initiations from the student include:

1. Placing desirable items in sight but out of reach. The student must initiate a request for the item or assistance to get the item (Neetz, et al. 1984).

2. Placing desirable items in clear, but difficult to open containers--"I see it, but I can't get it --without you" (the listener) (Stremel-Campbell, 1985).

3. " WAIT WAIT WAIT" for the student to initiate for his/her wants. " NOTHING IS FREE " (Stremel-Campbell, 1985).

4. "Playing Dumb" by giving the student a wrong item following a student's request. The student must elaborate on his/her request or repeat the request before being given the correct item (Schumacher, 1988).

5. "Forget" to do things, which are part of a routine. Does the child initiate and indicate in some way that he/she did not receive a cup or spoon at lunch time, or a brush for a painting activity, etc. (Schumacher, 1988).

6. Don't "wait on" students. The student must begin to take some care of himself. Set up situations in which the student must initiate to receive his/her needs and wants (Schumacher, 1988).

7. "Mess up" frequently. Hand the student his/her coat with the sleeve turned inside out. Misplace certain important items needed to complete a task. The student must initiate to bring attention to himself and to request aid (Schumacher, 1988).

8. Disrupt expectations such as blocking access to desired places, items or situations. What does the student do to initiate a request for assistance to get what/where he wants (Neetz, et al. 1984).

9. Do things "out of context" and inappropriately to a given routine or situation (Neetz, et al. 1984).

10. Regularly provide many opportunities for marking choices (Neetz, et al. 1984).

11. If a student does not have a variety of indications or forms to demonstrate intents, place him/her in a novel situation in which he/she must initiate to the adult in order to participate in the activity. For example, for a younger student, place him/her in a wagon and go and stop a few times (if this an enjoyable activity.) Then stop and WAIT for the student to indicate "go" in some way before you reinstate the fun or reinforcing activity. Do not accept "generic" signs such as "more" or "want" if the student is ready to begin to use a variety of requests and more specific output to communicate in particular situations.

See Halle (1984) and Neetz et al. (1984) for multiple strategies to increase initiations.

GOAL 4: Increase Students' Comprehension

Increase students' comprehension of and response to directions given verbally and/or via a supportive system (e.g. sign, natural gestures, graphics as BLISS, etc.) during interactive activities such as snack, leisure time, and peer interactions.

Example: Does the student respond to such directions as "give", "get", "put away", "give me another one", "clean up", "throw it away", or identify other students or peers in the class? For the student with physical handicaps, set up a toy car, truck, or other device (age-appropriate) which goes forward (and backward) or in a circle and can carry cups, napkins, etc. Teach the student to activate the toy with an adaptive switch. When it is time to give out or clean up materials or snack/lunch items, have a peer sit opposite the student, place an item to be given out (or collected) on to the car (or other device), and tell the student to "give X a cup, please." The student activates the adaptive device and the car travels with the appropriate item to the peer named.

At clean up time the procedure is reversed with the peers placing their cups, etc. on the car and the student making the car return with the item(s).

Place the trash container in such a position that the student can easily push trash into the can (consult OT for suggestion for movement of arm or hand for such a task). Devising a motorized "Lazy Susan Tray" that turns until the cup is in front of the correct person would also be useful for response to "give" or finding a student as directed. This could also be beginning practice for a scanning communication system. Such adaptations and strategies place our receptive language goals in the functional activities that the teacher has selected for his/her students, which is the major goal of the team process in program development for students having severe or multiple handicaps.

We are limited in our program development only by our creativity and attitudes regarding the student's learning potential. Detailed information on the development and use of adaptive and assistive devices will be included in the "Augmentative Communication Strategies" and "Switch Interfaces" modules of this manual.

VI. Eliciting Locutionary Communication (Standardized Language-Making Levels)

Many students who have very severe or multiple handicaps may never reach this level of communication. However, other students may have the potential for formalized use of language but, because of the physical or sensory deficits or severe auditory/verbal processing problems with spoken language (as in students having autism) can not exhibit their true cognitive and language levels. Such students need to be given creative programming which circumvents such disabilities and fosters their true level of communicative abilities.

GOAL 1: Selection of Symbolic Systems

Select a formal mode (modes) of communication to be used as a standardized language-making level (locution), (e.g. verbal/oral speech, sign, printed words, BLISS, picture boards, textured symbols, REBUS, braille, etc).

Strategy A. Determine Strongest Output Mode(s): Review "inventories of abilities" in the Assessment Strategies module.

Strategy B. Selection of Sensory Stimuli: Determine students' ability to tolerate and adjust to specific sensory stimuli to be used as "preparation activities" before and during work on locutionary language. Many students with physical and sensory disabilities require certain body positioning and handling to prepare them to speak or use an augmentative communication system. Others require certain safe tactile or movement input to help them attend to structured tasks.

Consult OT/PT regarding tactile, movement, and handling input useful to (or detrimental to) the student to use in preparation activities for use of the communication program. This will be most important if physical assist or tactile cueing will eventually be used with the student in communication programming or if adaptive/assistive devices are to be used. Consult with teachers and parents regarding the most (and least) effective sensory channels for the student's attending and learning . Do not forget that channels such as smell and taste can sometimes be as alerting as the more traditional sensory channels.

Example 1: Paul, a student diagnosed as having autism, had very little social interactions, shared attending or interaction with a variety of objects. He did, however, attend to visual-motor tasks and simple black and white figure drawings. It was also found that he alerted to certain smells very quickly. Paul enjoyed the odor of a particular marker and attended to the marker and adult who was using it. The odor of the marker was very successful in getting Paul to watch as the adult made the black/white line drawings to be used on Paul's communication board.

Example 2: Two boys, one in a kindergarten program and one in a secondary program, had little comprehension of auditory/verbal input for following directions or answering questions. Both, however, had strong "splinter skills" in the area of reading and comprehension of printed words. Programs were devised for both students in which the targeted goals of following directions and answering questions were presented in print on index cards. Both students were then able to attain these goals by following directions or answering questions that were in written form on cards.

Example 3: Eric, age three years, had been diagnosed as having severe auditory processing problems. He was nonverbal and could not follow many verbal directions. Parents were eager for him to talk, however. It was found that he had strong visual-motor comprehension, and readily comprehended, learned, and used BLISS symbols. In a very short time, he began to say the words depicted by the BLISS symbols during receptive and expressive language programming.

Strategy C. Determine Ease of Student's Usage of Possible Augmentative Communication Systems: Determine the ease of understanding communication systems by the general community in which the student lives and in which he/she will communicate. If necessary, choose a combination of systems for the student with extremely limited means of physical output. The goal is to provide the student with as much functional, communicative output as possible. Provide a functional, portable system for use when a student's main communication system is large or nonportable. Detailed information on this process is presented in the module entitled "Augmentative Communication Strategies." See case studies # 2, 3, and 4 in Appendix D for examples of early locutionary systems.

GOAL 2: Developing Use of the Locutionary Communication System

Strategy A: The Sequence

1. Vocabulary Selection: So often the selection of initial vocabulary for use in a student's locutionary language system consists of primarily nouns or "label words" and a few verbs that we "believe" will be the most useful for a student. There are also published lists available for such purposes. However, if a student's language system is to be effective, it must be "custom designed" to his/her specific needs in various environments. Therefore, we should use the environmental catalog concept to select the basic vocabulary that a student will need to function in his/her own unique setting throughout a given day. The SLP catalogs the student's communicative needs in all four of the environments of daily living (domestic, recreational/leisure, vocational, (academic) and community). Along with the student, family members, and teachers, a core vocabulary is developed for use in the student's initial attempts at locutionary language.

   Communication programming reinforces not only objects, but functions of important objects, actions on objects, names of most important people, activities, places, etc. See the handouts at the end of this module: "Verbal Reasoning Checklist", "Possible Target Sequence of Student Who is Ready for Verbal/Signed/Augumentative-Based Language Acquisition", and "What Do Children Say and Understand?" for overviews and possible vocabulary needs. BUT, remember the vocabulary must be based on each student's unique communicative needs. For example, the words "yuck" or "no way" are often just as important as labels, nouns, or verbs.

2. Use of Basic Semantic Relations: See the handout at the end of this module entitled "Five Aspects of Sentence Construction" to develop early two-word utterances. Be sure the student comprehends such two-word units.

3. Facilitate the use of multi-word units by combining basic semantic relations. (See same handout as above.)

4. Increase syntactically correct forms.

5. FOSTER QUESTION USE on the part of the STUDENT.

6. Facilitate higher levels of pragmatic skills (listed on assessment form).

Strategy B. In General: Communication goals are taught in active, functional ways at all levels of language treatment (e.g. avoid use of pictures when introducing verbs). Rather, have the student participate in the activity in some way. Use real objects to teach labels, and use student's body in relationship to other items when teaching prepositions, etc.

Strategy C. Home Carry-Over: If goals have been developed in a team situation, including the parent and student, there should be little problem in convincing the parents or caregiver to utilize the programs developed at school. Utilize peers in the student's environment and the student's siblings, as well, in "carry-over" programs. Provide clear, functional activities, which are based on the student's and family's lifestyle and routines. Avoid "extra work" for the family.

Strategy D. Developing Sample Dialogues or Scripts: Develop possible dialogues or "scripts" which might occur in a variety of activities and settings (e.g. lunchtime). Actually sit down and "talk" you way through an interaction your student might have as he/she enters the lunchroom/cafeteria. Use his/her augmentative communication system to do this. Did you really include all (or most) of the functional vocabulary he/she will need? Where's the phrase "yuk! I hate that stuff" or "Hi - give me 5!" or "uh oh! I spilled it." These can be represented as simply as a picture of a hand for "give me 5!" or printed out for the student who can read. BUT REMEMBER, our goal is to integrate each student as much as possible with nonhandicapped students/peers, so if the student is going to need to "CHILL DOWN" or "BUG OFF," these better be on the communication system! Refer to the "Augmentative Communication Strategies" module for additional information on scripting dialogues.

Goal 3: "Ensuring Success" in Communication Programming

Overall Suggestions:

A. Use functional activities, daily routines, and interactions which are frequent, age-appropriate, and cognitively appropriate.

B. Provide frequent opportunities to communicate.*

C. Arrange the physical environment so that you can at times:

1. focus student's attention, and then just wait for his/her communicative effort;
2. ignore until he/she initiates; and
3. let the student know that "nothing is free."*

D. Be sensitive to the STUDENT'S agenda, and the STUDENT'S internal schemata (McLean & Snyder-McLean, 1978).

E. Provide nonspeech cues at level of support needed, and do so systematically.*

F. Keep working toward a higher level of communication:

illocution--> to--> locution

Model
Expand
Expatiate
WAIT

G. Utilize strategies listed in the Goals 2 and 3 regarding eliciting multiple communication intents and initiations.

Adapted from Stremel-Campbell (1985).

GOAL 4: Increasing Vocalization in Parallel Programming.

When an effective system of communication is in use or being successfully taught, we often see an increase in oral speech. Additionally, some students are young enough to still hope for some oral speech development, or have untapped potential for oral speech that has not been recognized or accessed as yet. These students should not be denied the attempt to develop oral speech as they become more able. It is not within the scope of this manual to present programs for developing oral speech in students with severe or multiple handicaps, as this requires much discussion. The following are some suggestions for oral speech development. IF students have physical handicaps, OT/PT consultation will be vital as well as consultation by a speech-language pathologists who have a training in NDT (Neurodevelopmental Treatment). Input from OT's might be especially important for the student who is able to increase his/her vocalizations during movement or tactile activities. Caution is a must when such stimulation is considered, however, dependant upon the student's responses to various types and amounts of sensory input. Be sure to consult a pediatric OT before beginning such sensory input.

Suggestions for developing oral speech include:

1. Improve oral feeding abilities and oral motor skills (if needed). *
2. Improve respiration abilities (if needed). *
3. Provide appropriate positioning and handling for individuals with motor disorders, and utilize facilitation techniques to stimulate/elicit vocal output, or to improve the quality of vocal output.
4. Provide safe movement and tactile input (if indicated by specialists). *
5. Utilize "contagious" situations and social situations.

6. Utilize appropriate levels of imitation (mutual imitation, imitation within repertoire, and finally imitation of novel stimuli).

7. Utilize "gaming" activities. See the handout entitled "General Techniques" at the end of this module for a description.

8. Assume meaning to vocal attempts.

9. As vocalizations come under a student's control, make these functional as soon as possible, e.g. use /^/ for "up", /m/ for "more" or "Mom", /d/ for "done", etc. Do such work in meaningful, natural settings and activities. Even a few vocal sounds, (if under the student's control), can expand his/her output repertoire and thus, facilitate maximum potential for communication.

10. Stimulate for inflection, loudness, and pitch variations (which increases communicativeness of vocal output) as each level of vocalization achieved.

11. Reinforce the systematic, sequential order of vocalizations as they occur.

*** NOTE: Indicates need for consultation from specialists in the motor and/or sensory fields.**

See the handout entitled "Stages of Vocal Development" for systematic description of vocalization development located at the end of the Assessment Strategies module and see Morris (1987a, 1987b); Rosenwinkel, Kleinert, & Robbins (1980); and Marshalla (1985) listed in the references at the end of this module.

VII. Integrating Communication Programming into the Four Domains of the Student's Daily Life Practice and Overall IEP.

Special educators who teach students with multiple and/or severe handicaps utilize a variety of systems and approaches to integrate basic skills (goal behaviors) into the four domains of daily living. These domains include: domestic/independent living, recreation/leisure, vocational, and community/school. Each domain requires sets or clusters of basic skills from most developmental and/or academic areas, which are necessary for successful daily living. Basic skill areas include gross motor, fine motor, self-care, social, communication (receptive and expressive), cognition, functional academics, others (e.g. maximizing use of vision or hearing with students having such sensory disorders). The classroom goals for such students may include such goals included in the example for Matt shown in Figure 5.

Note that goals from occupational therapy (fine motor), communication (receptive/ exp. language), and sensory (vision) areas reinforce cognitive goals in the domestic domain. In the recreation/leisure domain, communication goals reinforce both sensory (vision), and occupational therapy (fine motor) goals. These same reinforcing patterns continue

gure 5

xample: Matt (age 18 years)

Domains	Basic Skills					
	Fine M. (OT)	Gross M. (PT)	Sensory	Communication Rec. (SLP)	Exp.	Cognition
Domestic (Independent Living)	activates switch to use appliance	sit indep. help in transfers	vision: match clothing by color	responds to directions: "put it here;" "Get more X."	touch items for choices	increase tool use (L.T. switch) matching colors (functionally in dressing) follows directions
Recreation/ Leisure	activates switch for TV & slide projector	participates in baseball throw; combing hair for ROM activities.	visually scans family members in slides when asked "Where's Dad?"	can identify family members in slides	uses comm. board to request; names family members via comm. bd.	follows simple directions tool use
Community/ School	point with hand on comm. bd. to order at restaurant	carries tray on lap tray of wheel chair to table at restaurant	looks at speaker(s)	turns to speaker when asked a question	responds to request using comm board when asked "Can I take your order?"	matches pictures on board to real food items
Vocational	activates electric stapler with switch	stands in prone stand for 15 mins during voc. task	sorts voc. material	responds to "Put it here," & "Get some more."	uses comm. board to request material for voc task	sorts tool use direction following

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throughout the overall educational plan for this student. In addition, note that the same basic educational needs are reinforced across domains for this student.

The design of INTEGRATED educational and therapeutic planning across domain areas with all disciplines, allows us to provide repeated trials or practice on multiple goals throughout the day and in various settings. In addition, all instruction is carried out in natural, functional contexts using age appropriate materials and activities.

Our goal as a team is to produce a single IEP document, which incorporates all the therapeutic disciplines in a coordinated fashion. Thus limiting the development of too many, and sometimes, nonfunctional goals that confuse parents and students - and even ourselves at times! Such planning facilitates an integrated or transdisciplinary model of service delivery. See the module entitled Service Delivery and Smith (1990) for more information on integrated therapy and transdisciplinary teaming.

The speech pathologist's role in such a program is to develop a communication program based upon the FUNCTIONAL NEEDS of the student in these four domains as developed by the full school team and parents. The SLP provides input to this program development, works with the student in the classroom, community, or other environments to establish the communication program. The SLP also works on a regular basis with the student, classroom teacher, aides, and parents by demonstrating the student's programs, providing suggestions as needed and determining when to alter (if necessary) or update the communication program based upon the student's success or failure in usage.

VIII. EMBEDDING BASIC SKILLS - ACTIVITY-BASED INSTRUCTION

Another important teaching strategy that special educators employ, is the concept of embedding basic skill goals (i.e. fine motor, gross motor, communication, cognition and sensory goals) into daily, functional activities and doing so in group interaction situations. An activity is selected from one of the domains of daily living: domestic, community/school, recreation/leisure, and vocational. Then, very specific IEP goals and programs are embedded into the activity. Data is collected on each skill. The activity maintains the student's attention and is a much more functional strategy for transfer of programming into daily life than more rigid 1:1, highly programmed and poorly interactive strategies. If at all possible, the student's nonhandicapped peers should also participate in such activities with the student. See the handout entitled "Involving SPH Students in Group Activities" at the end of this module for an example of such programming (Schumacher, 1988).

IX. PROGRAMMING FOR NATURALLY OCCURRING 1:1 INDIVIDUALIZED SESSIONS

There are situations and reasons when the SLP may wish to employ some isolated or 1:1 work with individual students. This can be done away from the classroom, if absolutely necessary. However, there are multiple opportunities for 1:1 instruction between the teacher and student (parent and child, therapist and student), which occur naturally during each day. These might include mealtimes, diapering, bathroom visits, dressing, transitions from activity to activity, etc. Our communication programming should include such situations as times for very specific communication work.

Example 1: Diapering: Receptive comprehension of up/down, on/off, wet/dry, move, sit up, lay down, all finished, etc.

Example 2: Mealtime: Expressive communication including ways to indicate choice making, expression of preferences (likes and dislikes); more; yes/no (indicatives); wait, "I'm ready," "I'm full/finished".

Mealtime provides one of the most rich and important communication atmospheres. If we are competent listeners, it can be tremendously productive for communication training. If we are "poor listeners", we set up an uncomfortable attitude for both student and caregiver, frustrate both student and caregiver, and increase the nature and severity of feeding disorders, since the student has no control over the situation. See Morris (1981) entitled "Communication/Interaction Development at Mealtimes for the Multiply Handicapped Child: Implication for the Use of Augmentative Systems" listed in the references at the end of this module.

X. OVERALL SUGGESTIONS FOR FACILITATING SUCCESSFUL COMMUNICATION PROGRAMMING WITH STUDENTS HAVING SEVERE AND MULTIPLE DISABILITIES

A. Keep working toward higher levels of communicative behavior. perlocution--> illocution--->locution

B. Train communication in the NATURAL ENVIRONMENT utilizing incidental teaching strategies whenever possible.

C. Don't "preempt" communication by fulfilling all the student's needs--Make a rule "NOTHING IS FREE" (Stremel-Campbell, 1985).

D. Arrange the student's environment so that you can focus the student's attention and wait for his/her communication effort.

E. Be sensitive to student's agenda and internal schemata (McLean and Snyder-McLean, 1978).

H. Provide opportunities to communicate that are frequent and specific to the student (Stremel-Campbell, 1985).

I. Work toward functionality at all levels of programming.

J. Utilize age appropriate activities, materials, and settings.

K. Foster interaction with the student's nonhandicapped peers whenever possible and select goals that lead to more integration of the student into home, school, and community activities.

L. Utilize the family's knowledge of the student and the student's information about himself/herself when developing communication programs.

M. Adjust programs, environments etc. to circumvent interfering motor and sensory systems.

N. Focus goals on functional use of communication in a variety of domains; specifically domestic, community, vocational, and recreation/leisure.

O. Be aware of and utilize available resources, persons/agencies funds, and technologies which are being developed rapidly for individuals who are nonverbal and have physical or sensory handicaps.

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GENERAL TECHNIQUES

1. **Mutual Imitation:** Occurs when a child vocalizes, the adult imitates the child, and then child continues to vocalize or take his turn. This can be a very useful tool to increase vocalization; increase vocalizations or movements directed to another person and foster early turn-taking and communication.

   After this type of interaction is established we can begin **spontaneous imitation** i.e. that which is directed by the adult. First we use **spontaneous imitation within repertoire**. That is we try to get the child to imitate a sound or movement we have seen him make before. This makes him much more likely to succeed.

   Next we can either introduce a <u>new</u> sound <u>or</u> movement or shape the child babbling by <u>inflection</u>. We make our sounds higher, lower, louder, longer, softer, etc. and see if the child follows.

   Next we shape the child's babbling into meaningful speech. For example if a child can make an /^/ (uh) sound, and he likes to move up and down, we can get him first to make that sound, then make it as he goes up and then ask him to imitate it before he gets to go up and finally "What do you want - UP?" and wait to see if the child begins to request "up". The same procedures could be used to shape gesture or movements to simple signs or gestures to communicate.

2. **Adaptations of Melodic Intonation:** A form of therapy used initially with adult aphasics after a stroke. The idea is to stimulate the right side of the brain with musicality to help re-develop language.

   We can use a modified version of this with our children with language delay:

   a. singing a song, highly inflected speech to gains children's attention;
   b. selecting one inflection for each quesiton form; and
   c. changing pitch of the most important words in a sentence to focus attention on those words (e.g. Where is your foot, foot, foot? - and touch, look at, move foot).

3. **Gaming:** Using repetitious speech and activities in play to develop language.

   Receptive: e.g. child and teacher build blocks, teacher says "up, up, up" and child assists building. Teacher says "OK, let's BOOM" and they knock over blocks as they say the words. Repeat over and over and gradually assist child less and see if he responds to the key words without teacher's aid.

   Expressive: same as above and be sure to couple the vocal with the motor - as if vocalization to part of the motor act of "grooming". Gradually wait to see if the child begins to use the word spontaneously as you play.

4. **Vocabulary:** Some early words to use in augmentative communication systems (sign, language board). Catalog child's environments to determine the most important communicative needs to include, for example:

Request	Movement	Needs	Refusal	Affirmative	People	Exclamations
want more "Bug off" "come here"	go up down in on out	eat drink play potty foods	"no" "stop"	"yes"	mom dad me other children peers teachers busdriver	"Ouch!" "Uh-oh!" "No way!" greetings

Also, observe child's favorite things and be sure to include these.

J. Kleinert (1982)

INVOLVING SPH STUDENTS IN GROUP ACTIVITIES

Three students labelled as SPH were involved in a group activity. All three of the students had severe motor disabilities and limited voluntary movement in combination with other handicaps.

Jill has some arm movements and auditory responding. Her IEP includes goals in following simple commands (within her motor ability), identifying body parts, "cause and effect", and posture and mobility for reaching with correct patterns.

Ben's IEP includes goals for increasing his voluntary arm movements, improving his head control, and initiating interaction with others (vocalization).

Jennifer's IEP includes goals for devleoping purposeful arm movements, responding to olefactory stimuli (limited vision and hearing), initiating touch of sensory items, and allowing her hand to be brought to her mouth with eating/tasting.

The three students were involved in the following activity:

DOMAIN: Domestic
ACTIVITY: Food Preparation - Making Pudding

Although the students needed almost full guidance in the core skills involved in making pudding (opening the package, pouring the milk, stirring, shaking in a plastic container, etc.), each student's participation in the activity addressed specific IEP goals. These IEP goals were addressed in the format on the attached page (e.g. same activity and materials, different task requests/criteria).

The activity itself included such things as:

- drawing attention to the box
- opening the box and smelling the mix
- putting the mix in the bowl and tasting the powder
- tasting the milk before it went into the mix
- stirring and tasting the mix
- sampling the pudding when it was finished.

All three of the students were positioned in wheelchairs drawn into a semicircle with the teacher in a chair in the middle. (If there had been two students, they would be placed side-by-side facing each other so that they can touch and see each other.

During each of the above steps, students took turns witth the materials. The trainer moved the materials from one to the other.

NOTE: The full activity, with students involved in all phases, took 45 minutes to an hour because of delayed response times due to severe motor disabilities.

Schumacher (1987)

Domain: Domestic - Food Preparation
Environment: Kitchen
Subenvironment: Table

ACTIVITY: MAKING PUDDING

STUDENT	BASIC SKILLS	EMBEDDED			
	FINE MOTOR	GROSS MOTOR	VISION	RECEPTIVE	EXPRESSIVE
LeAnn	touches materials	maintains appropriate head position	uses directed vision	responds to verbal command LOOK - TOUCH	requests food
Ronnye	uses eye-hand coordination functional use	NA	localizes/ tracks at 3'	responds to verbal command PUT IT HERE GIVE ME	Yes - No Do you want _____?
Stanley	uses objects appropriately	NA	NA	responds to verbal command TAKE THIS/GIVE ME	Do you want _____?
Gabe	allows touch to materials (nonresistive)	holds head up	attends to visual stimulation	respond to touch cue (with voice)	indicates ready for bite

DATA
SKILL Date (+ - 0)

LeAnn: _____

Ronnye: _____

Stanley: _____

Gabe: _____

D. Schumacher, SHIPP Project (1987)

INSTRUCTIONAL PLAN

STUDENT	INSTRUCTIONAL OBJECTIVE	STRATEGY	INSTRUCTIONAL PROCEDURES/REPORT SYSTEM	STUDENT RESPONSE	CONSEQUENCES	PASS/REVIEW CRITERION
Jill	Jill will respond to simle verbal commands	Commands "put down" and "take" during the activity (spoon, box, bowl)	Verbal cue (SD), given with a point/tap on the object to draw attention visually	Jill will make the basic motor movement to comply and attempt to participate (within 5 seconds)	If Jill initiates independently, praise and pat. Give no social if the initiation is delayed beyond 5 seconds. Assistance in participation regardless	
Ben	Ben will Initiate vocal interactions	Verbalize to Ben during the activity, by saying his name, pausing, then commenting "Ben, ____"	Place the objects within Jennifer's reach. Draw attention to them auditorially and let her touch where they are. Then, leave them in place to see if she initiates touching.	Jennifer will move her hand/arm within 10 seconds to retouch an object.	If Jennifer touches then praise with touch and social If Jennifer does not touch, guide gently from her elbow or shoulder.	

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D. Schumacher, SHIPP Project (1987)

AUGMENTATIVE COMMUNICATION

Judith L. Page, Ph.D., C.C.C.-SLP

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I. WHAT IS MEANT BY THE TERM "AUGMENTATIVE COMMUNICATION"?

A simple definition of the term is "all communication that supplements or augments speech". A more formal definition might be "any appliance or system designed to support, enhance or augment the communication of individuals who are not independent oral communicators in all instances". The following discussion provides some background on who might use augmentative communication and why.

II. WHO IS A CANDIDATE FOR AUGMENTATIVE COMMUNICATION? EVERYONE!

A. Typical Infants

Typical infants use augmentative techniques before they develop speech capabilities. Many students with severe and multiple handicaps may continue to rely on these infant techniques long past infancy. Examples of early developing augmentative communication strategies include: smile, eye gaze, differential vocalization (different sounds to indicate needs), body movement, orientation.

smile: e.g. infant smiles when a familiar adult comes into view or when a pleasurable stimulus is experienced

eye gaze: e.g. infant looks at object of interest, adult interprets as a comment on the object or request for the object

differential vocalization: e.g. infant produces different sounds when experiences different sensations/needs

body movement: e.g. infant kicks legs and waves arms when familiar adult arrives or when a pleasurable activity ceases

orientation: e.g. infant turns head or body toward a desired object

reach: e.g. infant reaches toward an object or person; interpreted as a request

B. Adults

Adults use augmentative techniques in addition to speech and, in some cases, instead of speech. Examples of typical adult augmentative techniques include: writing,

gestures, body movement, facial expression, vocalizations, proximity, pantomime, pointing, and signals. These techniques are typically used when speech is not feasible or would not be effective.

Some individuals may need specialized augmentative communication techniques. These individuals either do not speak or have speech that is not sufficiently intelligible to be used reliably for communication. For them, the typical combination of speech plus simple augmentative strategies used by typical adults is not sufficient. An individual may fall into this category for a variety of reasons, including sensory, motor, cognitive, or emotional problems. Whatever the cause, many have found some idiosyncratic means of attempting to communicate basic information. Unfortunately, these indiosyncratic means are often ineffective or effective only with very familiar communication partners. Professionals and users have developed specialized augmentative communication techniques as a way to provide more effective and more socially acceptable communication strategies.

III. WHAT TYPES OF SPECIALIZED AUGMENTATIVE COMMUNICATION TECHNIQUES/SYSTEMS ARE AVAILABLE?

Augmentative communication techniques/systems can be classified in at least two ways. The first classification (unaided vs. aided) is based on need for some type of prosthesis or device. The second classification (direct selection, scanning, and encoding) is for aided techniques only and is based on how the user accesses symbols or messages. Each classification has its own set of unique characteristics and prerequisite skills which influence the selection of an appropriate device for an individual. Both classification systems will be discussed below.

A. Unaided Techniques

These techniques require nothing in the way of a physical support system or prosthesis, no equipment of any sort is necessary. The individual communicating with an unaided technique makes use of movement of the body or parts of the body, especially the hands.

Examples of unaided systems include manual sign systems, gestures and pantomime. Unaided techniques have several advantages over techniques requiring some type of equipment. These advantages include:

Portability: Unaided techniques can be used anywhere and anytime; they do not get "left behind" or "forgotten".

Availability: For an individual using an unaided technique, the communication system does not break down or malfunction. As long as the individual has control of the specific body parts used for communication, they can communicate.

Expandability: The vocabulary available to the unaided communicator is limited only by the communicator's ability to learn and remember new symbols and the communication partner's ability to decode the symbols. These systems do not have the severe memory or space constraints more typical of techniques using equipment.

Inexpensive: Because unaided communication systems require no specialized equipment or devices, they are virtually cost-free to the user. There may be an efficiency cost factor associated with the time required to teach and learn new symbols.

Unaided techniques also have some disadvantages. These include:

Limited audience: Communication partners must know or learn the meaning of each symbol. With speech, this is no problem; with all other unaided systems, partners must often be taught what each sign/gesture/pantomime means. Even with manual signs, individuals with physical challenges may use modifications of the real signs, making them impossible to understand even for someone who knows sign.

Physical demands: All of the unaided systems require a high degree of motor capability, making them unusable for many individuals with severe physical challenges.

Arbitrariness: Although some signs and gestures are iconic (look like what they mean), many are arbitrary (have no apparent relationship to meaning). Signs/gestures which are arbitrary may be harder to learn, both for the user and for the communication partner. Also, the meaning of arbitrary signs/gestures cannot be guessed by unfamiliar communication partners.

Lack of independence: With unaided techniques, messages cannot be developed and stored independently; the communication partner must be present at all times for message formulation to occur.

Because of the limited potential audience and high physical demands of unaided communication, this module will not concentrate on these techniques. Instead it will focus on aided techniques.

B. Aided techniques

These techniques require some type of communication prosthesis for display of symbols. Individuals communicating with aided techniques must always have something other than just their own body available in order to communicate. These techniques may be classified as either soft technology, low technology or high technology.

Soft-technology techniques: These techniques use non-electronic prostheses and may include techniques like "twenty-questions", as well as communication

boards, notebooks, keychains, aprons, and trays; non-electronic eye-gaze techniques; and keyguards for typewriters or computers.

Low-technology techniques: These techniques require the use of simple electronic devices. Included are devices like the rotary scanner (Dial Scan available from Don Johnston or see instructions available in Goossens' & Crain, 1986a), tape loop communicators (switch activated tape recorder with a 10-15 second tape loop; a message is recorded continuously on the tape so than whenever the individual activates the switch, the message is heard), and attention-getting or signalling devices.

High-technology techniques: These techniques use sophisticated electronic devices for communication. They include dedicated communication systems (system used exclusively for communication purposes) and adapted computer systems (multipurpose microcomputers programmed to provide communication capabilities).

Aided techniques have several advantages over the unaided techniques. These are described below:

Wider potential audience: Most of the aided techniques, especially those involving electronics require little if any listener training to comprehend messages. Intelligibility of devices with voice output is determined only by quality of the output. Even those devices using less familiar symbols usually have the translation printed above or below the symbol, making intelligibility dependent only on ability to see and read the translation.

Fewer physical demands on the user: Aided devices generally require less complex motor functioning than unaided techniques.

Independence: Some of the aided devices permit independent message formulation which allows the user to develop messages without a listener present. This is not true for all aided techniques.

Aided techniques also present some unique disadvantages, such as:

Less portable: These techniques may not be usable everywhere (e.g. not in the shower, swimming, where there are not electrical outlets) and can easily be "forgotten" or "left behind".

Not consistently available: Devices/materials can be lost, damaged, or broken, leaving the student without a means of communication.

Limited vocabulary/message potential: Some devices may have more limited vocabulary/message potential than unaided systems. This is especially true of devices that use concrete symbols (pictures, Rebus symbols) rather than more generalizable symbols (alphabet, Blissymbols, MINSPEAK symbols).

C. Access/Indication Techniques are Divided into Three Categories

Direct Selection: user directly indicates symbol(s) comprising the message. This is accomplished in a variety of ways:

1. **Direct indication:** user points directly to objects (e.g. symbol shelf where the user selects a real object from a shelf of choices).

2. **Pointing communication board:** point with finger, head pointer, mouth stick, hand pointer (See Goossens' & Crain, 1986b "Commercially Available and Homemade Accessing Tools"). Examples of electronic devices include IntroTalker, AllTalk, Touch Talker, and WOLF.

3. **Expanded, guarded, modified keyboards:** user accesses symbols/messages via a keyboard that has been modified in some way to make it easier to access.

4. **Light-beam operated aids:** light beam typically head-mounted; commercially available examples include Epson SpeechPac, Light Talker, and Scan WOLF.

5. **Eye Gaze systems:** user looks directly at symbol representing message; symbols are usually mounted on clear plexiglass or plastic which is mounted between the user and the communication partner, but may also be an electronic sensor system which monitors location of eye gaze.

Direct selection is the simplest and most straightforward indication technique; making it the easiest to implement with young children or low functioning students. It is also the fastest of the three indication approaches if the user has the physical skill to use it well. It has the added advantage of providing very good direct feedback to the user; the user can tell if the correct message element has been indicated.

On the negative side, direct selection requires a greater range of motion than either of the other techniques. It also requires better fine motor control than the other techniques. For these reasons, many individuals with severe motor impairments are unable to use direct selection effectively.

Scanning: message elements are presented in a sequential manner and the user specifies choice by responding to the person or display presenting the elements. The user may respond by simply signalling when the correct choice is presented or by actively directing an indicator toward the desired choice. Types of scanning include:

1. **Linear Scanning:** the message elements are presented one at a time; the user indicates when desired message is reached. Examples include environmental scanning (Do you want...?), rotary scanners, a Light Talker set up for 8 locations, and the VersaScan (Prentke Romich).

2. **Row-column scanning:** device scans down rows (e.g. on an electronic scanning device all of the items in one row are illuminated, then all the items in the next row, etc.) and the user indicates when the target row is reached, then the device scans across the individual items in that row until the user indicates that the target item has been reached. Examples include the Light Talker, the Epson SpeechPac, and the Scan WOLF.

3. **Direct scan:** user controls the direction of the scan and stops device when correct choice is reached. A Light Talker controlled via a joystick is one example of this type of scanning.

Scanning is probably the most powerful of the three techniques discussed because it can be used by almost anyone regardless of the severity of motor impairments. All that is required is one consistent movement that can either activate a switch or signal a communication partner. When used in a simple linear fashion, it is also relatively concrete, making it useful for individuals at a low cognitive level.

Scanning has several weaknesses which render it a system of last resort. First, it is a very slow system, especially as the number of elements in the display increases. This makes it very frustrating, both for the user and for the communication partner. Second, because of the speed constraints, the number of possible message elements that can be displayed in a scanning system is limited. For cognitively normal users this presents a unique set of challenges in trying to provide an adequate supply of messages with a limited number of symbols. Although providing the alphabet and having the user spell messages helps alleviate the message supply problem by allowing the user to create an endless number of messages, it exacerbates the speed problem by slowing down the rate of communication. Several solutions to this problem are available, including prediction systems which require the user to initiate a message and then try to predict for the user which letter(s) or word will come next based on phonological or grammatical rules, display of alphabet on a device with the most frequently used letters in the most quickly accessed locations, and the Minspeak software (Prentke Romich) which allows maximum use of minimum symbols by storing messages under either single symbols or under a sequence of symbols (e.g. TRUCK + HOUSE could be "I want to go home" while TRUCK + SUN could be "Let's go outside"). A third weakness of scanning is that it requires the user to respond within a given time period before the next message element is presented. The time pressure introduced by this system may cause problems for individuals with muscle tone problems.

Encoding: the desired message elements are indicated by multiple signals from the user which are presented in a pattern that must be decoded by the device or the communication partner. With some applications this may simply require keeping track of the signals and following fairly simple directions; with others, this may require actually learning the codes. Types of encoding include:

1. **Morse Code:** individual uses Morse Code via a switch to control a communication device. An example of this type of system is the Morse Code programming for the Epson SpeechPac.

2. **Two movement encoding:** user indicates a two element code which corresponds to a particular message element on a communication board. For example, user points to or looks at or stops a rotary scanner on two numbers to indicate the message's location on a row and column grid (e.g. signal '2' then signal '3' indicates the message element is in the second row, third column).

3. **ETRAN:** user indicates code using eye gaze and a plexiglass frame. On the typical ETRAN for letters and numbers, the letters and numbers are arranged in blocks of 5-6 around the outside of a plexiglass rectangle with a center cut-out. The user looks first at the block containing the target letter and second at the position on the ETRAN corresponding to the target letter's position within the block of letters (e.g. if letter is in lower left corner of the block of letters/numbers originally selected, the user's second look would be to the lower left corner of the ETRAN board).

Encoding has some advantages that make it an attractive alternative for some augmented communicators. First, it has the potential to be much faster than scanning, especially for users who require extensive vocabulary. Second, it allows access to a larger number of vocabulary items than scanning or many of the direct selection formats. Third, it allows the user to control the response rate, eliminating some of the problems associated with the time pressures resulting from scanning.

Although it can be a fast means of accessing a larger number of symbols/messages, encoding requires typically more fine motor control than scanning and also requires higher cognitive abilities to learn and use the encoding format. The cognitive requirement frequently rules out encoding as a viable system for many developmentally young individuals who might otherwise benefit from these techniques.

IV. WHY SHOULD AUGMENTATIVE TECHNIQUES BE CONSIDERED?

There are three general reasons or goals for using augmentative techniques. Most students with severe and multiple handicaps should be included in one of the last two.

A. **Use of augmentative techniques as a temporary means of communication until spoken communication returns or is again a feasible option.** This goal is typical for individuals who acquire a temporary condition which may prevent the use of spoken communication (e.g. laryngitis, jaw wired shut following oral surgery) or who encounter situations in which spoken communication is not effective (e.g. very noisy situations, communicating with someone who cannot hear, communicating across distances).

B. **Use of augmentative techniques as a life-long means of communication.** Individuals in this category may use augmentative communication either to augment existing spoken communication or to take the place of non-existent or ineffective spoken communication. This goal is typical for individuals with physical or sensory disabilities, either congenital or acquired, which interfere with speech production.

C. **Use of augmentative techniques as a means of facilitating the development of spoken communication.** This goal is typical for individuals whose capacity for developing effective spoken communication is uncertain. There is substantial case history evidence of previously nonspeaking or severely unintelligible children who have not made progress using traditional therapeutic techniques both learning to use augmentative communication and beginning to produce speech or improving their intelligibility after the initiation of augmentative communication training. For this reason, with some children, augmentative communication training may be viewed as a technique for facilitating the development of spoken communication.

Several different reasons have been proposed in an attempt to explain why augmentative techniques have been effective when traditional oral language training techniques have not. First, it is postulated that input in an additional modality, or in what for that student may be a stronger modality, may facilitate their acquisition of communication in general of both oral and augmentative modalities. Second, switching from oral to augmentative training may remove some of the pressure felt by a student having difficulty with oral communication. For students having difficulty with muscle tone, removal of this pressure may make it easier for them to relax and produce more intelligible spoken communication. Third, many of the augmentative symbols are more iconic (i.e. look like their referent) than spoken symbols; this may make them easier to learn and remember than spoken symbols. Fourth, many of the augmentative techniques require a simpler motor response than is needed for speech. Fifth, in the expressive mode, augmentative responses are easier to mold and shape than they are in the spoken mode. Finally, display of augmentative symbols is usually more "permanent" than spoken words, which cannot be prolonged. A child who needs longer exposure to the symbol paired with its referent may find that augmentative techniques provide the necessary exposure time while spoken words do not.

In addition to the three general reasons discussed above, there are other benefits to be gained from the use of augmentative communication techniques. Specifically, augmentative techniques are useful in teaching both receptive and expressive language skills to low-functioning students. Use of augmentative techniques, including adapted play activities, with children at prelinguistic stages of development may also help children develop cognitive skills including categorization, means-end, and causality. Augmentative techniques can also be used as signals rather than symbols as a means of providing basic communication for students who do not have the cognitive skills to develop symbolic communication. For many children,

augmentative techniques provide a more reliable means of social interaction than is available to them through the oral modality only.

V. DECISION-MAKING CONSIDERATIONS IN AUGMENTATIVE COMMUNICATION

Recommendations regarding programming using augmentative communication techniques should be made by a team consisting of parents, professionals, and when appropriate the potential user him/herself. Yorkston and Karlan (1986) suggest appropriate team members and describe the role and contribution of each. Speech-language pathologists bring to the process a knowledge of normal and disordered communication and should also provide input on selection and programming of augmentative techniques/devices, appropriate intervention strategies, and procedures for assessing socio-communicative functioning before and after intervention. Educators are responsible for planning appropriate social and academic experiences and integrating augmentative components into classroom, school, and community-based activities. Physical therapists provide input regarding motor control, physical management, and positioning to maximize access to augmentative techniques. Occupational therapists may also provide information regarding positioning in addition to making recommendation for adaptive equipment which will allow optimum access to augmentative technology. Psychologists may provide information regarding current level of cognitive functioning and estimations of learning potential. Rehabilitative engineers may be responsible for application and modification of existing mechanical and electronic devices. Computer or technology specialists evaluate and modify existing software programs and write new programs when necessary to meet augmentative communication needs. Social workers may work to identify family and community resources and assist in obtaining funding for devices. Other contributing disciplines which may contribute to decisions and/or management include physicians, audiologists, ophthamologists, neurologists, rehabilitative nurses, and prosthetics specialists.

Speech-language pathologists interested in further reading regarding their role in augmentative communication are referred to the American Speech-Language-Hearing Association's Position Statement on Nonspeech Communication (ASHA Ad Hoc Committee on Communication Processes and Nonspeaking Persons, 1981)

Despite the descriptions of team members' roles, in many real situations a smaller number of professionals may carry the responsibilities for several disciplines that are not available to the team. Also, depending on the individual user's characteristics, the full range of disciplines may not be necessary. Teams should make every effort, however, to obtain information from the full range of disciplines that are appropriate for any given user.

A. An augmentative communication evaluation typically includes the following components:

1. Oral-Motor Evaluation
2. Seating and Positioning Evaluation
3. Language Profile
4. Evaluation of Motor Abilities
5. Determination of Communication Needs
6. Selection of an Appropriate Technique/System

B. As a part of the overall evaluation process, augmentative communication teams are faced with answering three basic questions.

These three questions are:

1. Is the student an appropriate candidate for augmentative communication?
2. Is the student a candidate for an aided or an unaided communication system?
3. If an aided system is indicated, what type of system should be used?

In determining whether or not a student is an appropriate candidate for augmentative communication it is important to remember that augmentative techniques can be an intervention tool as well as an intervention goal. Many individuals who attempt to make decisions regarding possible candidacy for augmentative communication use some type of decision-making matrix. For a discussion of some of the matrices that have been used refer to Reichle & Karlan (1985).

Decisions regarding aided vs. unaided techniques are also incorporated into several of the decision-making matrices. Typically such decisions are based on information regarding motor skills, sensory skills, and communication requirements of the technique. Goossens' & Crain (1986b) provide a protocol which may be useful in determining whether a potential user exhibits greater potential for manual vs. graphic symbols.

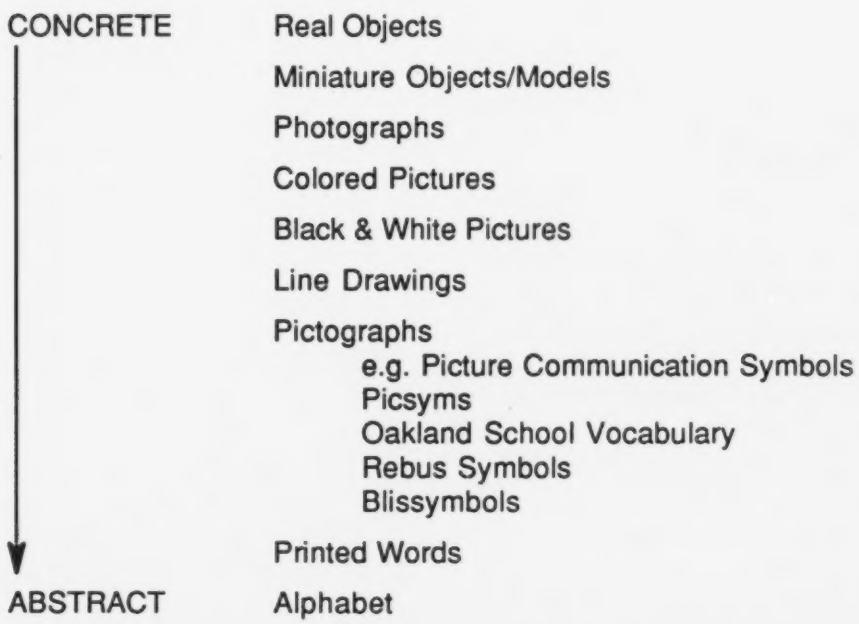
C. Decisions regarding which particular augmentative technique should be used are based on making an appropriate match between the student's abilities, the student's communication needs, and the augmentative system's characteristics. Evaluation entails collecting information via observation, interview, and direct testing which answers the types of questions listed below:

QUESTION 1: What are the student's abilities?

1. What is the student's current communication status? See the Assessment module of this manual for specific suggestions regarding assessment of communication status. This information addresses the need for an augmentative technique, role of the technique, the level of sophistication required of the technique, and contexts for use of the technique.

2. What motor control exists in various physical positions? See the module entitled Switch Interfaces for a discussion of evaluating for possible switch access to a device. In addition to providing information regarding potential for switch activation, evaluating motor control provides guidance in determining what type of access/indication techniques (direct selection, scanning, encoding) are available to the student, the size and placement of the symbols, and how the symbols should be displayed.

3. What level of symbol representation is possible? Each type of symbol that can be used in an augmentative communication systems falls somewhere along a hierarchy ranging from concrete to abstract. As students' cognitive levels increase they are able to deal with increasingly abstract symbol systems. Tne hierarchy is as follows:



4. What is the student's level of functional vision? This information influences the size, placement, and figure-ground arrangement of the symbols used for communication as well as the type of access/indication technique which can be used (e.g. a student with poor vision may not be able to use visual scanning, but may be able to use a scanning device which provides auditory scanning).

5. What is the student's level of functional hearing? This information influences the student's ability to make use of any auditory feedback/output provided by either a device or the switch used to access the device.

6. What is the student's mobility status? This determines whether or not the technique needs to be portable and how portable.

7. What is the student's cognitive status? Contrary to views held in the past, a student's cognitive status should NOT be used to deny a student use of a technique (e.g. Saying a student is not yet cognitively ready to communicate); rather it should be used to determine what type of symbols a student is able to handle and what type of access/indication technique a student will be able to learn to use successfully. See the description of each access/indication technique for information on relative difficulty.

8. What is the student's attitude and motivation for augmentative communication? In addition to the student's attitude and motivation, the attitude of the student's communication partners can have a strong effect of whether or not the student is successful with the technique. Consequently, attitudes of frequent communication partners should also be assessed. In cases where parents/caretakers question the need for an augmentative system or the need for a system is in question, it may be useful to obtain 10 cards with pictures the child is likely to know and make sure he/she knows a label for each picture; then select a parent/spouse, another familiar communication partner, an unfamiliar partner, and a team member and ask each person to write what the child says (says 1 time) with no cues. Repeat the process a second time with a general cue and determine percent intelligibility. For successful use of speech, intelligibility should be at least 70% to unfamiliar listeners without contextual cues. The information obtained by this may assist in evaluating intelligibility, to persuade significant others and/or client of the necessity of augmented communication, and to document the need for insurance coverage.

QUESTION 2: What are the student's communication needs?

1. What messages does the student need to communicate? One way to determine what messages a student needs to communicate involves completing environmental inventories, or catalogs of all of the communication situations encountered by the student throughout the day and then determining what types of messages the student does communicate, attempts to communicate, or does not attempt but should communicate. Following the format described in the Assessment and Intervention modules, the environmental inventory might consider domestic, community/school, vocational, and recreational/leisure environments. The professional engaged in this process should pay special attention to messages important to the

student, not just to those message in the environment that adults would like the student to use for their convenience (e.g. bathroom).

2. With whom does the student need to communicate? An inventory of the potential communication partners will influence what type of augmentative system should be used. For example, if the student needs to communicate with individuals who cannot read, the output of the system must be other than printed words; if the student needs to communicate with hearing impaired partners, auditory output alone is not sufficient; if potential partners are visually impaired, auditory output may be necessary.

3. Where does the student need to communicate? This questions addresses such decisions as must the augmentative technique be portable, waterproof, non-electronic, etc.

4. In what positions (e.g. sitting in wheelchair, on floor; sidelying; standing) does the student need to communicate? This information will affect how the student is able to access the augmentative system and how it is mounted/placed.

5. What communication modalities are necessary? This addresses such questions as does the student require auditory, temporary visual (display) or permanent visual (hard copy) output.

6. What communication needs are currently being met? Needs that are currently being met via non-augmentative techniques or currently existing augmentative techniques should not be supplanted by a new system unless the current techniques are ineffective or socially unacceptable. To provide maximum communication for the student, any new technique should expand, not replace, the student's communication repertoire.

7. What needs are not currently being met? Examiners should determine which of these unmet needs are essential, which are desirable but not essential, and which are unimportant. This information will assist in planning vocabulary/messages to be included and the types of communication that should be available via the recommended augmentative technique.

QUESTION 3: What are the system's characteristics?

1. What cognitive level is required and will the student's cognitive level allow him/her to operate the system?

2. How is the unit controlled and does the student have the physical skills to operate it?

3. What is the nature of the output and is it appropriate to the child's needs? Included in this question is information about what type of output is provided

(e.g. paper, picture, synthesized/digitized speech, type of voice), what must the student do with the output, with whom can the student communicate using this output, whether the student can monitor the output visually or auditorily, and whether the system can change its output in different situations.

4. What is the nature of the display and is it appropriate to the student's needs?

5. How fast can messages be transmitted?

6. How will the system be used? (e.g. Does it need to be portable? Available at home?)

7. What is the cost? In addition to purchase price, the cost factor should take into consideration availability of financial assistance for purchase and maintenance, cost and availability of repairs, cost and convenience of ordering operating components (e.g. paper, tapes, printer ribbons, etc.), and availability of loaners. In almost all these categories homemade devices are superior to commercial devices. With voiced output systems it is important to determine whether the child can understand the output of the device.

8. How long will it take the student to learn to use the system? Optimally, the student should be able to start using the system for communication almost immediately. With very low-functioning students, obviously, the meaning of "immediately" must be relative to the student's rate of learning.

9. How much training does the communication partner need to understand communication? A system which requires a great deal of training for the partner will not be terribly useful in a wide range of communication situations. It is desirable to attempt to identify a technique/system which requires minimal skill on the part of the communication partner.

10. How much will the system interfere with ongoing activities? The technique or system should interfere minimally with ongoing activities, because if it interferes too much either the student or the communication partners will be unwilling to use it on a regular basis. If it does interfere, the benefits must be great enough to offset the disadvantages.

Although many of the questions discussed above appear to relate to higher functioning students, most of the questions have application for even the most severely impaired student. Persons evaluating individuals at this level simply adjust the questions according to the cognitive functioning of the student.

VI. IMPLEMENTATION STRATEGIES IN AUGMENTATIVE COMMUNICATION

The implementation teams typically consist of a speech-language pathologist, a (special) educator, parents/caretakers, physical or occupational therapists, and classroom aides or paraprofessionals.

The primary emphasis of intervention should be on meeting current communication needs and on programming for future needs. In working with this population, the burden of proof rests with the professionals to discover and make use of the student's potential. A functional, as opposed to a developmental, approach to intervention is critical with this population, especially with older students.

Intervention should incorporate consistent modelling and reinforcement of augmented communication. The most powerful reinforcement comes from the environment itself in the form of the successful communication (i.e. getting what you asked for or having your communication partner respond in the way you intended).

Intervention strategies with many severely and multiply handicapped students may begin with activities/strategies intended to facilitate cognitive development. For typical children, play with a variety of objects is one of the primary means of developing cognitive skills (a la Piaget's sensorimotor stage of development). Children who are physically handicapped may not be able to play comfortably with objects, taking away this avenue of cognitive exploration and development. Consequently, several techniques have been developed which allow physically handicapped children to engage in more typical types of play behaviors.

A. Play Vest

One technique which facilitates typical play behavior is the play vest (Goossens' & Crain, 1986b). This vest, worn by the student has snaps or loop velcro across the front. Toys or objects to be used by the child are attached to elastic; on the end of the elastic is the opposite side of the snap or hook velcro which allows the object to be attached to the vest. Because the toy/object is attached to the vest, it is always within the child's reach, even if she/he happens to drop it. Use of snaps or velcro allows different toys/objects to be used as need or interest changes.

B. Play Frame

A second technique to facilitate play behavior is the play frame or activity frame (Musselwhite, 1985; Goossens' & Crain, 1986b). The play frame is a device from which changing toys or objects can be suspended. The child is placed under the frame, with objects hanging at a level which permits comfortable reach.

C. Playboard

A third technique is what Carlson (1982) called a playboard built on what Goossens' and Lewis (Goossens' & Crain, 1986b) called an adjustable easel. This device uses a pegboard on an adjustable easel to anchor toys or objects for interaction. This device facilitates play for children who are unable to hold two objects and use one object to act on the other (e.g. feed a doll). An example of its use might be to have a doll anchored in the center of the pegboard and other objects which could be used to interact with the doll (e.g. bottle, spoon, washcloth, comb) attached to the pegboard via elastic cord on either side of the doll. In order to use one object to act on the other, the child must simply manipulate the object on the elastic cord, the doll stays where she is and the child does not have to try to hold or stabilize it. Because the pegboard is on an adjustable easel, the angle can be adjusted to meet the physical needs of individual children.

D. Commercially Available Toys

A fourth technique involves adapting commercially available toys via the use of velcro. Self-adhesive hook velcro can be placed on the bottom of all toys the child will interact with. The hook velcro sticks to indoor-outdoor carpet which should be placed on laptrays or other surfaces that children with physical handicaps use. Components of toys that are used together, but hard to get to stay in place, especially on a slanted laptray (e.g. cooking pans and the burners of toy stoves) can be made more stable by using hook velcro on one piece and loop velcro on the other. A child who has difficulty picking up or holding objects or components of toys (e.g. a spoon to stir) may be helped by wearing a glove with loop velcro on the palm if pieces of hook velcro are placed on the toys/objects to be held or picked up.

E. Electronic Devices

In addition to the non-electronic adaptations described above, many uses can be made of simple electronic devices. Electronic devices can range from simple battery-operated toys to environmental control techniques for electronic devices.

The use of switches to control electronic devices serves several purposes for severely and multiply handicapped children. First, and perhaps most important, it allows these children to engage in play behavior. Second, the child who learns that activating a switch makes something happen is developing knowledge of cause and effect. Third, by using the electronic devices to accomplish goals (e.g. turning on the microwave to make popcorn; having an battery-operated dog bring you a snack which has been placed on his back or in his doggy backpack) allows the child to develop knowledge of using a means to accomplish an end. Another use of adapted electronics is the adapted slide projector remote control (Goossens' & Crain, 1986a) which allows a child to advance a carousel slide projector by activating a simple switch. This allows

the child to be an active participant in a normal social activity, to entertain him/herself looking at slides of family or classroom activities, or to "look at books" if each page of the story book is photographed and the pages placed in order in a carousel.

Simple electronic devices can also be used to establish simple communicative interaction. Examples of devices used for this purpose include signalling devices, use of the tape loop device to convey a simple message, scanning with real objects to make simple choices (e.g. Prentke Romich VersaScan), and use of computer adaptation (e.g. Unicorn keyboard, Touch Window, PEAL software) for simple communicative exchanges.

Goossens' and Crain describe several applications of electronic and non-electronic adaptations in their handouts on "Early Intervention with Electronics", "Early Social Communication Skills: Adaptations for the Motorically Involved" and "Guidelines for Establishing Early Cause and Effect through Use of a Switch Interface". They also describe the transition from early social communication situations to more symbolic communication in their handout on "Transitioning to Symbolic Communication". Refer to the references at the end of this module to obtain an address to request copies of these handouts.

F. Level of Symbol Representation

Once a student begins the transition from early non-symbolic communication to more symbolic communication, the level of symbol representation to be used becomes an issue. A general symbol hierarchy arranged by concreteness/abstractness was described in an earlier section. It is important to determine what level of symbol representation a student is able to deal with and begin intervention there. A goal of intervention is to move the student as far up the hierarchy (towards use of more abstract symbols) as is feasible. A technique that can be used to aid the student in making this transition is to pair the next level of symbol with the symbol a child is currently using and then to systematically fade the old symbol level. For example, if the child is using real objects to communicate, then either miniature objects or colored photographs of the objects should be presented simultaneously with the real object. Goossens' and Crain describe this strategy in their handout on "Suggestions for Transitioning Through the Representational Hierarchy".

Symbols are available from a variety of sources. Several of the companies included in Appendix E in this manual publish symbol vocabularies (also see Goossens' & Crain, 1986b, "Commercially Available Graphic Symbol Sets for Aided Communication"). Miniature objects can be collected from a variety of sources, including toy stores, kitchen stores (magnets), and fast-food restaurants (toys representing menu items). The original box for toys or objects should be saved if there are pictures of the toy/object on the outside. Those pictures can be cut out and saved for colored symbols or photocopied for realistic black and white pictures.

G. Vocabulary Selection

Selection of appropriate vocabulary for inclusion in training is an issue that can make or break the success of the intervention. Since natural reinforcement (getting what you asked for) is the most potent motivator for communication, it is imperative that the messages used are those of interest to the child. It is also important as training progresses to allow maximum communicative use of the symbols selected. For this reason, interventionists should carefully plan the lexicon for training. Goossens' and Crain (1986b) in "Guidelines for Selecting an Initial Core Vocabulary for Early Intervention" and Fristoe and Lloyd (1980) provide some suggestions for one approach to selecting vocabulary. Using their guidelines, items selected for training must have potential for frequent use in the child's environment, must be usable in a wide variety of semantic relations and multiword combinations, and should be easily learnable. Others (Frumkin & Baker, 1987) are advocating the use of scripts and dialogues to identify truly functional vocabulary/messages. Scripting requires that a category of communication environments be developed and then that sample dialogues for each environment be developed. The dialogues should then be modified to reflect realistic language use and to be as generic as possible. For devices using whole messages, these dialogues should be entered into the device; for those using single word vocabulary, the dialogues serve as a source of vocabulary items.

H. Intervention/Facilitation Strategies

There are several specific intervention strategies which can be used to facilitate acquisition of augmentative communication. Each will be discussed below:

Environmental Modelling: This strategy recognizes that children learning to use augmentative communication systems need to be exposed to communicative use of the system in a way that attempts to replicate the language learning environment of the child learning spoken communication. The implication is that others around the child need to use the symbols he/she will be expected to use. This can be accomplished in a variety of ways, including having adults wear a symbol vest (see Goossens' & Crain, 1986b) which allows them to point to symbols as they say the word, placing symbol displays in accessible locations at home and at school to be used by either the adult or the child, pairing the symbols with the objects by placing symbols on objects in the child's environment, and modelling the use of the device for communication during social interactions with the child.

Parallel Programming: This strategy recognizes that a child may have several skills to acquire as part of learning to use a communication systems. Rather than expecting the child to work on all of the skills concurrently by simply using the system, the interventionist should identify the subskills and work on each separately before expecting the child to put them all together and use the system for communication.

Teaching in an Interactive Mode: This strategy uses shared turn-taking activities that lend themselves to communicative exchange to teach the use of the system. The basic components (Goossens' & Crain, 1986b) of this approach are:

1. Provide the child with appropriate language input,

2. Capitalize on existing communicative attempts - model augmentative when the child makes idiosyncratic attempts/expand the child's augmentative communications,

3. Heighten the communicative demands placed on the child - don't anticipate/deliberately misinterpret/provide consistent modelling,

4. Improve accuracy of communication - misinterpret inaccurate communication/provide hand-over-hand shaping, and

5. Train others in the environment to use these techniques with the child.

Other strategies which may be used in augmentative communication training include incidental teaching, mand-model, and time delay (refer to Intervention section of this manual). Specific information about these techniques can be found in Halle (1982).

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[**NOTE:** To obtain handouts by Goossens' and Crain contact Sparks Center, University of Alabama Box 313, University Station, Birmingham, 35294, (205) 934-5448]

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SWITCH INTERFACES

Pamela D. Smith, Ed.D.

SWITCH INTERFACES

Pamela D. Smith, Ed.D.

I. WHAT ARE SWITCH INTERFACES AND HOW ARE THEY USED BY CHILDREN WITH SEVERE MOTOR DISABILITIES?

A switch interface is used by persons with physical limitations and allows the user to control or use a device or appliance. Switches have been used to operate battery operated toys and devices (e.g. tape recorder, radio), electrical appliances, communication devices, and microcomputers. The following lists provide examples of the many uses of switches. *

A. Development of Basic Skills

Motor Skills & Mobility: directed reach, maintain body alignment (head & trunk control), hands to midline, head raising/turning, motorized wheelchairs and other mobility aids

Communication Skills: tape recorder with endless loop tapes, clock communicator or Dial Scan, electronic communication devices (e.g. Light Talker), microcomputers with speech synthesizers

Sensory Skills: black light, magnifier lamp, toys with lights

B. Participation in Activities Across Life Domains*

School: electric pencil sharpener, electric scissors, tape player/recorder, slide projectors, microcomputers

Home Living: blender, mixer, popcorn popper, can opener, coffee pot, food processor, juicer, microwave oven, sewing machine, toaster, toaster oven, vacuum cleaner, fan, lamp

Self-Care: make-up mirror, blow dryer, curling iron, footbath, electric shaver

Vocational: paper shredder, electric stapler, microcomputers, conveyer belt, power tools, various machines

Recreation/Leisure: battery operated toys for play, tape player/recorder with music or stories/books on tape, radio, stereo, television, movie projector, slide projector, vibrating pad/massagers, electric organ, battery operated card shuffler

***NOTE: Many of these require adaptations or the use of a control unit, remote control device or battery adapter. (see handout entitled "Helpful Hints" at the end of this module)**

II. WHY IS IT IMPORTANT TO HAVE A LONG-TERM PLAN FOR SWITCH USE?

It is critical to develop both short-term and long-term plans for switch use. Many times, professionals are "caught up" in the technology or the trend of the moment. They begin to use switches with individuals, because it is "the thing to do", then may limit the use of switches to the operation of battery operated toys or tape recorders. These are valuable uses of switches, but are very basic uses. Professionals should develop long-term plans that include using switches for many purposes, such as those previously listed: a primary long-term use for switches is to access a communication device.

Initially, the major objective or focus of programming for a student may be to learn to use a switch for a particular purpose. This purpose must involve an activity that is highly motivating for the student. Consult the list above for ideas in making this initial decision. It is suggested to teach the use of the switch first within the context of another activity (e.g. listening to music) before using the switch to operate a communication device. The student must learn to use the adaptation first, then learn to use it for communication purposes.

After a student learns to use the switch, it can then be used as a vehicle or method to improve the student's motor performance, communication capabilities, ability to perform functional tasks, and participation in daily routines or activities with others.

- The use of switches should promote skill development and independence in communication, recreation/leisure, vocational, self-care, and domestic domains.
- The use of switches should promote partial participation in a variety of daily activities and routines.
- The use of switches should promote interactions with others, particularly with the student's nonhandicapped peers.
- The use of switches can increase independence and raise the individual's status in the eyes of others due to their increased capabilities.

III. WHY IS PROPER POSITIONING OF THESE STUDENTS IMPORTANT?

Persons with motor disabilities such as cerebral palsy, have abnormal muscle tone and may lack voluntary movements or have uncontrolled movements. In general, they lack a secure base of support for performing controlled movements. Proper positioning provides a foundation for movement.

Positioning provides proximal stability (closer to the midline of the body or trunk) to promote mobility of distal body parts (further away from the midline or trunk, e.g. head, arms/hands, feet/legs). The main purpose of positioning is to provide enough support to allow the student to concentrate and perform isolated, purposeful movements without appropriate positioning, the student is forced to use all his/her energy to attain and/or maintain good body alignment instead of using that energy and effort to participate in the targeted task or activity.

Professionals should work closely with physical or occupational therapists to determine the optimal position for switch activation. When working with physical and/or occupational therapists to make adjustments or adaptations to wheelchairs or positioning equipment, obtain permission from the student's parent(s) or legal guardian(s).

IV. WHAT ARE THE MOST COMMON POSITIONING OPTIONS AND HOW ARE THEY USED?

A. Optimal Positioning in Sitting (Wheelchair):

The following section describes the optimal positioning posture for sitting. Some individuals will not be able to assume this position due to joint tightness, contractures or spinal deformities. However, this is the optimal and we should attempt to approximate this as closely as possible. Additional positioning and seating adaptations may be needed to accommodate individuals with severe deformities. However, some adjustments and adaptations can be quickly and easily made that will greatly improve the individual's movement capabilities. Use the least intrusive alternative when choosing positioning components (e.g. headrests) and adaptations: Only provide the level of support that is necessary for the individual. These components should support body parts and facilitate more controlled voluntary movements. Do not add positioning components that are not needed.

The progression of positioning an individual in sitting follows a proximal to distal order or direction:

1. Position the hips/pelvis first, then
2. Support/position the legs/feet, then
3. Position the trunk and shoulders/upper arm, and
4. Last, support/position the head/neck and arms/hands.

This order of events is critical, because correct positioning of each body part has an effect on all other body parts. For example, if the pelvis is appropriately positioned first, the individual may have better trunk control and not require further supports for

the trunk. Conversely, if the trunk had been positioned first, it may have appeared that trunk supports were needed; but the problem with the trunk was related to the position of the pelvis. Again, following the proximal to distal order described above is critical.

Pelvis/Hips: The pelvis should be positioned as far back in the seat as possible (no rounding of the lower back/spine) with the weight evenly distributed across the buttocks. Generally, there should be a 90º angle at the pelvis/hips. However, persons with increased extension in the legs may need more flexion (bending) at the hips via a wedge seat/roll seat, by raising the footrests higher, or using a towel or roll under the student's thighs above the back of the knees to provide more flexion at the hips. The pelvis/hips should be secured with a seatbelt mounted at a 45º angle across the pelvis to maintain the pelvis/hips in the proper position.

Legs/Feet: The feet should be flat and well supported using a footrest or other foot support (e.g. box, books, blocks). The knees and ankles should be positioned to provide 90º angles. Most footrests can be easily adjusted up or down to provide the appropriate angle. If needed, straps can be added to maintain the feet in the appropriate position on the footrests.

Trunk & Upper Shoulders: Many students with severe physical involvement may require trunk or shoulder supports. The most common type are front chest panels that provide support to the trunk and shoulders, and assist in maintaining the trunk in midline. Other students may require support to the side of the trunk (e.g. scoliosis pads).

The best type of chest panel is a "butterfly" harness that provides support to the front of the chest, slightly above the breasts. Many wheelchairs (e.g. Care Chair, etc.) have an H-harness, which does not work as well as a butterfly harness because the seatbelt is connected to the H-harness and cannot provide proper positioning of the pelvis and the trunk at the same time. A simple solution is to add an additional belt so that one belt can serve as the seatbelt to position the pelvis and the other belt can be used to secure the H-harness. If additional positioning of the shoulders is needed (e.g. to get abducted shoulders/arms positioned toward midline), see Section V. on positioning the arms and hands.

Head/Neck: The head should be positioned in midline with a slight chin tuck. Do not attempt to position the head unless the pelvis/hips, legs/feet, and trunk/upper shoulders have been positioned correctly. Positioning of the head is directly related to positioning of the shoulders (see above). Also, better head control can be attained with proper support of the arms that further support the shoulders and assist in improving head control (see positioning techniques for arms and hands).

Some students may require a neck collar, headrest, or neck roll. The neck collar provides support to the neck to allow the individual to develop and use active head control (available from Otto Bock). A neck roll can also be used to provide support to

the neck. These can be easily made out of soft foam or a rolled up towel, and are positioned behind and around the sides of the neck.

If a headrest is needed, choose one that provides support yet allows for active movement of the head. Contoured head supports facilitate better midline positioning of the head than flat head supports. A small number of individuals may need total support for the head. One option is to recline these children slightly when in a sitting position to assist in supporting the head.

NOTE: For additional information on specific positioning and seating problems, consult the handout entitled "Positioning Students with Severe Motor Disabilities for Function" at the end of this module. These positioning principles and strategies are also applicable to students sitting in chairs (desks) other than wheelchairs.

B. Other Positioning Options:

Students with motor disabilities require a variety of positions throughout the day (e.g. sitting, sidelying, prone over wedge, etc.). When designing communication boards and devices, it is important to keep these positions in mind. The board or device should be usable across these positions. Also, the position of the switch and how it is stabilized or mounted may change across these positioning options. The position used for switch activation must provide the optimal motor output and should be appropriate for the activity (e.g. lying positions may be appropriate for listening to music or watching T.V.). Consult Rainforth and York (1987) for more information on positioning and their use within activities.

Adapted Chair: Students who do not use a wheelchair may require adaptations to their school chair or desk, such as a box to support their feet or a seatbelt to keep their pelvis in position. Other chairs are commercially available with various components that may be added (available from Rifton).

Corner Chair: A corner chair provides a floor sitting position and assists in inhibiting extensor tone in trunk and shoulders (available from Rifton or can be homemade).

Sidelying: Sidelying promotes relaxation and facilitates hands to midline and symmetrical body alignment. Sidelying may be accomplished through the use of good positioning techniques with pillows and/or wedges. A sidelyer may be needed to attain and/or maintain this position (available from Rifton or can be homemade). Sidelying is a good position for leisure activities (e.g. listening to music or stories/books on tape).

Prone Over Wedge: Positioned prone over a wedge is a frequently used position for developing head control and weight bearing on extended arms. However, this position may not be functional for switch use for some activities (e.g. operating kitchen appliances).

Standing: Standing may require bulky equipment like prone or supine standers (available from Rifton). However, many students will be positioned in standing during some part of the day. Standing promotes trunk and hip control and allows access to work areas that require standing (e.g. counter, sink).

V. WHAT POSITIONING TECHNIQUES CAN BE USED TO INCREASE ARM AND HAND FUNCTION?

In positioning the arms and hands, make sure the student's overall body positioning is appropriate first (see section on "Optimal Positioning in Sitting"). Overall positioning has a tremendous effect on the use of arms and hands. Again, a proximal to distal direction is followed: The shoulders are positioned first, then the arms, and the hands are positioned last.

Arms/hands should be positioned towards midline. When sitting, the arms should be supported by a surface that is the correct height (e.g. table, desk, lap tray). In general, the support surface should be at such a height that the forearms are well supported with 90º angles at the elbows (this angle will be less than 90º if an incline or slant board is used). This position provides support to the arms and shoulders. Appropriate positioning of the arms and hands can also improve control of the head, because a good foundation for head control is facilitated by supporting the upper body and shoulders through positioning the arms/hands. The following are suggestions for positioning the arms and hands. For additional information on specific problems in positioning the arms and hands, consult the handout entitled "Positioning Students with Severe Motor Disabilities for Function" at the end of this module.

Adjustable tables/desks: Adjustable tables or desks support the elbows and forearms. They usually adjust for both height and incline/angle of work surface (available from Rifton or can be homemade). Most students with motor disabilities work best on inclined surfaces.

Slant boards: Slant boards serve the same purpose as adjustable tables or desks. The major advantages are that they are inexpensive, light weight, and transportable. These can be purchased from special equipment companies or homemade (Goossens' & Crain, 1986a; 1986b). Also, other equipment can serve as slant boards such as positioning wedges and typing stands.

Elbow blocks: Elbow blocks provide support at the elbows and are used to position the arms towards midline. Some of these can be attached to a student's lap tray (available from Rifton or can be homemade).

Pommels and Dowels: Pommels and dowels are attached to the work surface to stabilize the child's nondominate hand. This may assist the child to assume a more stable upright sitting position and better use the dominate hand for switch activation. Pommels with a suction cup attachment are available from Rifton. Dowels can be

easily made using plastic plumbing pipe and attaching it to the student's lap tray or table top with suction pads/cups (see Positioning the Switch) or metal flanges (available from hardware stores).

VI. CONDUCTING SWITCH INTERFACE ASSESSMENTS

The process of conducting switch assessments presented here was developed by the Ontario Crippled Children's Center in Toronto, Canada (Shein, Eng, Eng, Lee, & Pearson, 1983). The clinical component defines and collects information on four key factors that are considered crucial in determining switch input control: M = Movement Pattern, S = Control Site, I = Switch Interface, P = Positioning of Switch Interface. More information on this process can be found in Goossens' and Crain (1986a).

A. Determining the Movement Pattern:

Movement should be voluntary, reliable, and as controlled as possible. A reliable movement is one that the student can consistently perform without excessive physical effort or excessive increases in muscle tone (stiffening or tightening of muscles or limbs). Voluntary movements are those movements under the student's control that he/she can intentionally perform. This eliminates the use of extraneous or reflexive movements. The two most common reflexes that may be present are the asymmetrical tonic neck reflex (ATNR) and the symmetrical tonic neck reflex (STNR). In the ATNR, head turning causes increased extension (straightening) of the arm on the "face side" of the body and increased flexion (bending) on the "skull side" of the body. In the STNR, head extension (pushing back) causes both arms to extend (straighten) and head flexion causes the arms to flex. These reactions make switch activation difficult.

These reflexive movements are not to be mistaken for voluntary movements and are not to be used for switch activation or other purposeful activities/functions. Work with a physical or occupational therapist to determine a reliable and voluntary movement pattern that is more physically beneficial for the student.

Use movements of the hands and/or arms, if possible, since these are closer to "normal" manipulation skills. Controlled movements of other body parts such as the head, foot, or leg/knee are also options if hand or arm movements are not possible.

Hand & Arm Movements: The options for hand and arm movements include 1) extension (straightening) of the elbow (push down or pressing motion), 2) movement of the arm towards midline, 3) movement of the arm away from midline, 4) flexion of the elbow (push upward motion, e.g. switch could be inverted), and 5) wrist flexion (bending, pushing down or pressing).

Head Movements: The options for head movements include 1) turning/rotation of head (to the right or left), 2) head tilting (to the right or left), 3) neck/head flexion (movement of chin downward, switch under chin), and 4) head extension (use only as a last resort, tends to trigger extensor patterns and increased tone). With head

movements, try to obtain the slightest movement possible that can be used to activate the switch. The use of large head movements is not recommended, because this will result in loss of eye contact with the device/toy/listener and require more "recovery time" before the next activation or response.

Leg & Foot Movements: The options for leg and foot movements include 1) leg/foot movement to midline, 2) leg/foot movement away from midline, leg/hip flexion (switch mounted inverted above the knee), and 3) leg/hip extension (push/press with foot).

B. Determining the Control Site:

The control site is closely related to the movement pattern. The control site refers to the exact location on the body that makes contact with the switch.

Hand/Arm: Control sites on the hand or arm include the palm, inside (radial) and outside (ulnar) portions of the hand or arm, back of the hand (switch mounted in inverted position), and the fingers.

Head: Control sites on the head include cheeks, side of head (tilting motion), chin, and back upper portion of head (head extension). The eyebrow may also be used in conjunction with an eyebrow switch.

Leg/Foot: Control sites on the leg and foot include the inside or outside portion of knee, the top of the knee (switch inverted), and the sole or heel of the foot.

C. Determining the "Best" Switch Interface:

Switch interfaces are available in a variety of types, shapes, and sizes (see handout entitled "Types of Switches"). Prices vary greatly from one manufacturer to another. Many can be homemade (see handout on making notebook switch at the end of this module). However, the most common type of switch used is the pressure switch that requires pressure or pressing to activate. Try this type of switch first before moving on to others.

Most classrooms/schools have some switches available. It is best to keep a list of all switches available in the school district and where they are located so they can be used by all school personnel. It is not recommended to order a switch for a student unless an assessment has been conducted using the same type of switch to determine if it is an appropriate choice for the student.

Switches (both homemade and commercially available) vary according to the following aspects:

Size/Shape: The size and shape of the switch may be important for mounting considerations and activation. Is the switch too high or difficult to make contact with to activate? Is it bulky, making transport difficult and/or drawing unwanted attention to the student?

Durability: The durability of the switch relates directly to how the student activates the switch. Will the switch receive a lot of abuse? Is the switch for testing and/or "try-out" purposes? If so, durability may not be the primary consideration.

Sensitivity: The sensitivity of the switch relates to the amount of pressure/touch required to activate it (read the fine print when ordering!). This should be matched to the student's movement/motor requirements.

Weight: The weight of the switch may be important for mounting considerations and transporting the switch.

Operating Mode: The operating mode chosen should be based on the student's needs and the uses of the switch. A direct/continuous or latching mode may be required (see handout entitled "Helpful Hints" for a description of these two types of operating modes).

Feedback: Does the student require a particular feedback mode (auditory, visual, vibro-tactile)? This is particularly important for students with sensory impairments.

Hermatically Sealed: A hermatically sealed switch is "waterproof" or has protection against moisture. This is important if the student drools excessively, which may dampen the switch (e.g. switch mounted under chin).

Cost: What financial supports are available? Homemade switches are very inexpensive (see plans contained at end of module). Commercially available switches range from $4.00 (Radio Shack, see handout entitled "Types of Switches") to hundreds of dollars.

D. Positioning the Switch:

You may want to review Goossens' and Crain (1986a, pp. 113-126) to clarify information presented in this section. Positioning the switch also includes stabilizing or mounting the switch. Ideas for stabilizing and mounting switches are included under each of the following sections.

For hand/arm activation:

Horizontal (mounted/positioned on flat surface)
Inclined (remember many students work best on inclined surfaces, refer to section on positioning arms and hands)
Vertical (mounted/positioned so that switch is on its side)

Inverted (mounted upside down, movement may be to raise arm/hand up to make contact with the switch, makes getting off the switch easy)

Symmetrical (centered, positioned at midline)
Asymmetrical (positioned to the right or left of midline)

Flush (mounted/positioned so that switch is flush with supporting/work surface, e.g. encased in tri-wall or foam)
Recessed (mounted/positioned so that switch is recessed into supporting/work surface)
Elevated (mounted/positioned so that switch is elevated above supporting/work surface)

Mounting Ideas and Materials for Hand/Arm Activation:

Dycem (non-skid surface, stabilizes switch, available from Fred Sammons)
Suction Pads (used to mount bar of soap to wall in tub/shower, rubber with small suction cups on both sides, discount stores)
Suction Cups (discount and hardware stores, Fred Sammons)
C-Clamps & Pony Clamps (discount and hardware stores)
Velcro (available from notions section in discount stores, most durable type from medical supply company such as Ali-Med)
Poly-Lock (like velcro but plastic with twice the strength, available from Consumer Care Products, also sold by other companies as Dual-Lock)

For head activation:

Horizontal (mounted/positioned flat, for chin activation)
Vertical (mounted/positioned on its side, to activate by other movements of the head)

Mounting Ideas and Materials for Head Activation:

Chin Mount (positions/mounts switch under chin, attaches to child's body, commercially available from Prentke Romich, instructions for making see Goossens' & Crain, 1986a; pp. 149-151)

Plastic Plumbing Pipe (1/2" plastic plumbing pipe and various angle joints are used to construct custom switch mounts, mount is attached to wheelchair frame with electrical ground clamps, switch is attached by velcro to metal flange attached to switch mount; all materials available from hardware store, approximate cost of finished product $5-$8 each) [handouts available from Goossens' & Crain, see Suggested Readings and Resources at the end of this module]
Commercially Available Switch Mounts (expensive $100+, from Prentke Romich and Zygo)

For leg/foot activation:

Horizontal, inclined, vertical options may be needed (foot activated ones can use same mounting ideas and materials as hand/arm, switches that require knee/leg activation may be mounted using same ideas and materials as head activation)

VII. CASE STUDY: CUSTOMIZED ETHAFOAM SWITCH MOUNT

Description: Eight-year-old male child with severe spastic cerebral palsy, quadraplegic involvement (equal involvement in all four extremities); predominate extensor tone that increases with effort and when he is frustrated; persistent ATNR reflex to the right (right arm primarily remains extended, left arm primarily remains flexed); attends a regular elementary school in a class for students with physical disabilities and is integrated with the first grade class for lunch, music, art, and "homeroom" activities; functioning level estimated at educable/mild level, but unreliable at this time due to lack of functional means of communication, which interferes with testing

Presenting Abilities: Bright, good receptive language, cooperative, frustrated by inability to control body (particularly controlling effects of ATNR). Currently, using two switches, one mounted on each side of wheelchair under arm rests. Uses arm movement of each arm to contact switch on side of hand. Each switch is connected to a tape recorder that has an endless loop tape. One tape says "yes" the other says "no". He was using light touch (LT) pressure switches.

Presenting Need: Primary need is to determine optimal switch positioning and mounting. Current position/mounting of switches results in asymmetry particularly when he looks at and activates switch to the right, which triggers the ATNR on most occasions.

Future Applications: Already has good reliable yes/no response using facial expressions with head movements. Communication should be expanded to expressing wants, needs, and making choices. Limiting his output to yes/no responses, significantly limits his ability to communicate. In addition, his facial expressions and head movements for "yes" and "no" are much more efficient and functional. Future applications could include endless loop tapes with choices so they can be used as a scanning device, use of clock communicator/Dial Scan, and computer access. His mother also expressed an interest in using the switches for toys and music for leisure/play time, and for environmental control by allowing him to turn the lamp at his bedside on and off.

Assessment Process and Materials: Positioning was assessed and adjustments made in his wheelchair. He uses a Care Chair with abduction wedge, H-harness, seat belt and lateral head support on the right (was being used to keep head in midline so it did not turn to right, triggering the ATNR). He also has a lap tray for his chair. Overall body positioning was assessed first and adjustments made and/or recommended. Upper body (arm/hand) positioning was done second. Next, motivating toys were used to prompt switch activation so that observations could be made about how he activated the switch when it was placed in various positions and how this affected his muscle tone and body symmetry. Ethafoam-velcro modular components were used to position the switch in an array of positions while conducting observations (Goossens' & Crain, 1986a; pp. 123-126) His custom ethafoam-velcro switch mount was constructed from the results of these observations. Assessment through construction of ethafoam-velcro switch mount = 2 hours.

Assessment Results and Recommendations:

Body Positioning: The seatbelt in his chair was connected to the bottom of the H-harness and was unable to maintain his pelvis at a 90o angle. A second belt was added to accomplish this. Because of his predominate extensor tone, a towel was rolled up and placed at the edge of the seat surface just behind his knees to provide more flexion at hips to reduce extension of the legs during the remainder of the assessment. It was recommended that his footrests be raised so that they provide more flexion at the hips (serves the same purpose of the towel but more permanent). The lateral head support on right was removed. It appeared that this stimulated head turning to that side and triggered the ATNR instead of keeping the head in midline as it was intended. The result was a significant decrease in head turning to the right and a decrease of the ATNR response, which was interfering with body symmetry and switch activation. Hence, his arms/hands were able to remain in midline most of the time making switch activation easier for him.

Positioning of Arms/Hands: His lap tray was too low and did not support his elbows and forearms. It allowed them to extend, which is an abnormal pattern that we wanted to discourage. Also, there was a gap between his lap tray and the sides of his wheelchair/trunk that allowed his elbows to become "stuck" there. This interfered with his ability to support his arms and experience optimal hand use for switch activation. Ethafoam-velcro wedges were made to support his elbows and forearms and close the gap that allowed his elbows to fall down inside the tray. An ethafoam-velcro switch mount was constructed that supported his forearms in a flexed and inclined position. The inclined position of the switch mount reduced the amount of extension in his dominant arm/hand (right) being used for switch activation. Because of changes made in his overall body and arm positioning, his hands were more relaxed and were not fisted as they were before. He was then able to use the fingers of his hand for switch activation. The angle and position of the switch was determined by observations of his performance with the switch located in various positions on his tray. Switch activation

with these adjustments was easier, more reliable and did not result in body asymmetries or increased muscle tone. The results of the switch assessment are:

Movement (M)	=	flexion of fingers and/or wrist flexion of right hand
Control Site (S)	=	fingers/distal portion of the hand
Switch Interface (I)	=	light touch (LT) switch (Don Johnston $42.00)
Positioning Switch (P)	=	Flush, inclined 20º, asymmetrical three inches to the right; ethafoam-velcro customized mount
COST OF MATERIALS	=	$5.00

Note: We were able to use the light touch switch he already had. This same "set up" could have been done with various switches including the homemade notebook switch contained at the end of this module.

VIII. CONDUCTING SWITCH ASSESSMENTS AND TEACHING SWITCH ACTIVATION USING MOTIVATING ACTIVITIES

Both battery-operated devices and electrical appliances can be interfaced with switches, serving as rewards for switch activation. Select rewards based on the individual's needs and interests. The following attributes of devices should serve as a guide.

A. **Sensory Input:** Devices have a variety of sensory inputs (visual, auditory, and tactile) and combinations of these. These include the sounds, lights and tactile qualities of the device. Use caution and common sense when initially presenting these to children with seizure disorders or extremely high muscle tone. Too much sensory input or particular types of sensory input may trigger seizures or increases in muscle tone in some children.

B. **Movement Patterns:** Toys (and some electrical appliances) exhibit various movements patterns. These should be matched to a child's visual skills, tracking abilities, and/or interests.

C. **Age-Appropriate:** Select devices and activities that are appropriate for the student's age. Young children may prefer toys such as the hopping bunny, barking dog, musical bear, or nursery rhymes on cassette tape. Older children may prefer tape recorded music, toy robots, or race cars, popcorn popper, battery operated fans, slide projector, or lite brite toys. Adolescents may enjoy

radios, videos, TV, blow dryers, and kitchen appliances such as blenders or food processors. Select devices that the child's same age peers would enjoy.

D. **Choose Devices that Increase Participation and Interaction:** Whatever the choice of motivating device, it should allow for increased participation in daily activities and interactions. Activating the device with a switch cannot be an end product or static activity. It must be active, participatory, and interactive. Battery operated toys can be used for creative play or for play with others. Electrical appliances can be used to participate in a variety of domestic activities such as cooking.

E. **General:** Select devices and appliances that fit the child's needs and interests by demonstrating them to the child first, then allowing the child to control the device via the switch. Many children enjoy music, so that is a good place to start. However, remember to have several tapes that contain an array of music types (e.g. classical, soul, pop, rock, hard rock, country, children's songs, etc.) and for different ages. What you may like (or think the child will like) may be not be what the child likes! Some children prefer small fans/blow dryers for their tactile qualities instead of the "adorable" toys we purchase. Let the child's needs and interests drive the process. Consult Goossens' and Crain (1986a, pp. 132-139) and Levin and Scherfenberg (1986) for more ideas.

Suggested Supplemental Readings and Handouts

"Things to Be Considered" and "Bright Ideas for Using ALD's" (Handout available from ABLENET)

"Appendix B - Solving the Mystery of What Size Plugs and Jacks to Use" (from Burkhart, 1987; pp.347-348)

Order form for books, switches, and battery adapters from Linda Burkhart (see Appendix E for address)

"Single-Input Control Assessment" (from Goossens' & Crain, 1985a; pp. 107-112)

"Determining Optimal Format for a Laptray Mounted Switch" (from Goossens' & Crain, 1985a; pp. 113-118)

"Constructing a Styrofoam/Triwall Recessed Switch Mount" (from Goossens' & Crain, 1985a; pp. 119-122)

"Constructing Ethafoam-Velcro Modular Components for Achieving Customized Recessed Mounts" (from Goossens' & Crain, 1985a; pp. 123-126)

"Conducting Single Switch Assessments within Motivating Task Formats" (from Goossens' & Crain, 1985a; pp. 132-139)

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Helpful Hints & Terms

Pressure Switch - requires pressure/touch to activate, most used type (foot pedal switch for tape recorder: a pressure switch, available from Radio Shack for $3.00, comes with subminiature plug; plugs into "remote" jack of tape recorder)

Wobble Switch - various movement used to activate, less accuracy required for activation

Head Control Switch - activated by the position of the head (to be determined and positioned on the student by consulting with OT or PT), can also be attached to the wrist or arm using predetermined movements to activate; available from Linda Burkhart or can be easily made (plans are contained in her books)

Continuous Switch/Momentary Switch - type of switch that requires the student to maintain contact or continuously activate the switch for it to operate the device (e.g. student must keep pressing switch to keep toy or tape recorder on)

Latching Switch - type of switch that requires one activation to turn the device on and it stays on until a second activation of the switch is made that turns the device off: very appropriate for use with device that commonly should stay on (e.g. tape recorded music, TV), best if used after student has learned to activate the switch using a continuous switch described above, also available is an interface unit that changes a continuous switch to a latching switch (ABLENET, Don Johnston)

On/Off Switch - type of switch that operates the same as a latching switch described above, can be purchased at Radio Shack and encased in an "experimental box" also from Radio Shack

Timer - interface device that allows you to set amount of time device stays on, helpful to increase opportunities/initiations when training switch usage

Counter - interface unit that has a counter built in to record the number of switch activations the child makes

Battery Adapters or Toy Adapters - interface that allows you to use a switch with an "off the shelf" battery operated toy or device, available from Linda Burkhart and ABLENET to fit all battery sizes or can be homemade

Control Unit - interface between switch and electrical appliance, allows the user to activate common household appliances (e.g. mixer, blender, television, hair dryer) (see handout from ABLENET entitled "Working Together to Help Achieve")

Remote Control - similar to the control unit, but allows the use of electrical appliances without the problems of multiple wires and allows activation from across

various distances (e.g. across the room, from another room); control unit is plugged into wall electrical socket and the appliance is then activated by using the remote device with a switch; remote controls that allow for switch usage can be purchased (Don Johnston) or those that do not accept a switch can be adapted to do so

Adapters - Jacks and plugs for both switches and other devices come in three different sizes (see below). Adapters may be used to allow you to interface two devices with different plugs or jacks of two different sizes. These are available from Radio Shack and are called "phone jacks/plugs" (approximately $1.00 to $1.50 for each). When making your own switches and adaptations, it is suggested to use the miniature size plugs and jacks because they are easier to solder and more durable than the subminiature plugs.

1/8" = miniature
1/16" = subminiature
1/4" = primarily used by Steve Kanor

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POSITIONING STUDENTS WITH SEVERE MOTOR DISABILITIES FOR FUNCTION

Body Part	Desired Position	Problems	Solution/Adaptation
Pelvis/Hips	Pelvis/hips well seated in chair.	Excessive hip extension so buttocks rise.	Wedge seat insert for 10-30° more hip flexion (try small roll, roll/towel/foam behind knees).
	Weight evenly distributed over buttocks & thighs.	Sliding out of chair.	Try wedge seat insert if excessive hip extension. Use nonskid seat surface. Use seatbelt to secure pelvis in place. Mount seatbelt at 45° angle to hips.
	90° of flexion at pelvis hips.	Posterior pelvic tilt with extension of lower extremities. Seat depth too deep.	Measure from most posterior part of buttocks to back of knee, then subtract 2-3" to determine correct seat depth. If current seat is too deep, use seat back insert of determined thickness to make seat depth more shallow.

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Body Part	Desired Position	Problems	Solution/Adaptation
Pelvis/Hips (continued)	Symmetrical position of hips in midline.	Hips out of midline. Seat width too wide.	Use seatbelt as described above. Measure across hips/thighs then add 2" to determine correct seat width. If seat is too wide, use solid lateral hip supports to make seat width more narrow.
Legs	Symmetrical and in line with body. Knees flexed 90° angle.	Excessive extension or excessive adduction of legs (close together).	Flexing the hips more than 90° using wedge seat or making sure the feet are well supported to get flexion at the knees should do.
		Excessive abduction of the legs (legs apart).	Seat may be too wide or the child may be hypotonic (low tone). See above for using lateral hip/thigh supports.
Feet	Feet flat and well supported with weight evenly distributed.	Extraneous movement or unable to keep feet in position	Use footrest with straps mounted at 45° angle to angle to maintain ankles in 90° angles.

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Body Part	Desired Position	Problems	Solution/Adaptation
Trunk	Upright and in midline without leaning forward or to one side or the other.	Excessive forward flexion.	Butterfly straps/ harness with the top/ shoulder straps mounted directly to the chair over the shoulder and the lower strap mounted directly to the chair. A laptray angled 30-40° mounted at an appropriate height (see arms) can facilitate trunk extension.
		Leaning to one side.	Firm padded trunk supports.
		Excessive trunk extension.	Make sure hips seated correctly. Try a small wedge behind shoulders to facilitate slight forward flexion. Make sure chair facilitates an upright 90/90/90 sitting position; Chairs that are tilted back tend to increase extension.
Shoulders	Relaxed and slightly rounded; not too protracted (pushing forward) or retracted (pulling backward).	Excess protraction (usually with neck flexion).	Try an angled lap tray in sitting to provide arm support to assist in lower back extension.

Body Part	Desired Position	Problems	Solution/Adaptation
Shoulders (continued)			Good trunk and shoulder support should decrease shoulder protraction (see trunk and mounting of butterfly straps).
		Excess shoulder retraction (seen with elbow and wrist flexion).	Try triangular wedges behind shoulders with narrow end at spine and wide end behind shoulders to bring shoulders forward.
		Excess shoulder elevation (raised).	Lap tray or table surface may be too high. Support surface should be at such a height to allow support of the arms with elbows flexed and the shoulders relaxed.
Arms/Hands	Arms forward towards midline and relaxed. Flexed at the elbows and resting on support surface (table or lap tray).	Excess extension in arms (usually seen with overall extension pattern).	Recheck overall positioning. May require more hip flexion to reduce overall extension pattern.

Body Part	Desired Position	Problems	Solution/Adaptation
Arms/Hands (continued)		Excess flexion at elbows (usually seen with head flexion).	Sitting position may add to overflexion problem. Try a standing device to promote extension in the body. Angled laptray may increase arm extension.
		Excess abduction of arms.	Try the upright sitting position. Try elbow blocks to bring arms to midline.
		Excess movement in arms.	To decrease arm movements, total body should be positioned well in sitting. Laptray or table top should be at correct height to provide support to the arms. Using a pommel to stabilized the non-dominate arm and hand may be needed to provide added stability to reduce excess arm movements.
		Arm/hand movement determined to be inefficient to access device.	Determine other reliable method to access (head, leg, foot). Stabilization of both arms using pommels or using the lap tray to restrain the arms may reduce excess arms movements, stabilize upper body and enhance controlled head movements.

Body Part	Desired Position	Problems	Solution/Adaptation
Head	Head vertical and in midline with slight neck flexion.	Excessive head flexion (head leans forward).	Try reclining the chair 30-40° from the upright position.
		Slight neck extension if head resting on head support.	Check shoulders for alignment and adequate support. Try lap tray to support arms and increase head control.
		Excessive head extension pattern.	May be related to overall body extension. Check for adequate hip flexion (see pelvis/ hips). Some children may use the headrest to "push off". The headrest may need to be removed/ altered.
		Head is not in midline and leans to one side (asymmetrical).	Make sure the trunk is well supported on both sides and front (see trunk). Check shoulder support. Try a contoured headrest to position the head in midline. Provide a laptray to support arms and improve head control/position (see arms).

LEVER (NOTEBOOK) SWITCH

Materials

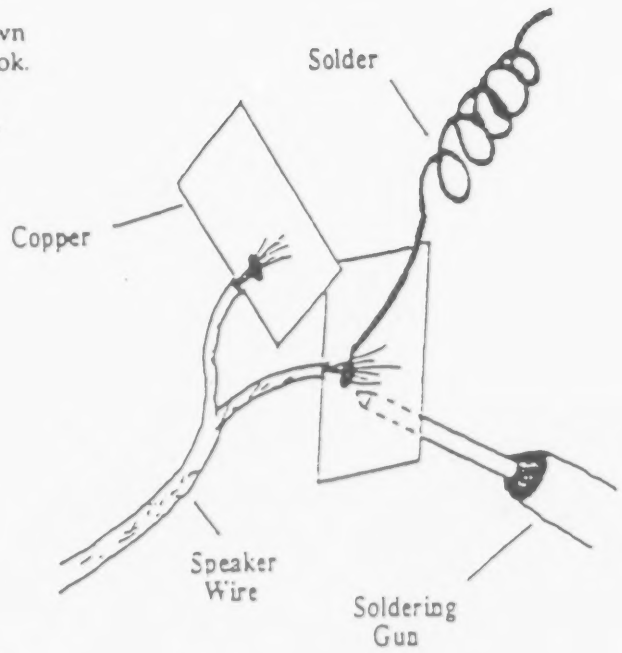
Copper sheeting
Speaker wire
Notebook
Foam rubber
1/8" Phone plug (miniature)

Equipment

Soldering iron/ Solder (rosen)
Electrical tape
Needle nose pliers
Scissors
Hot glue gun/ glue
Steel wool
Wire strippers

Directions

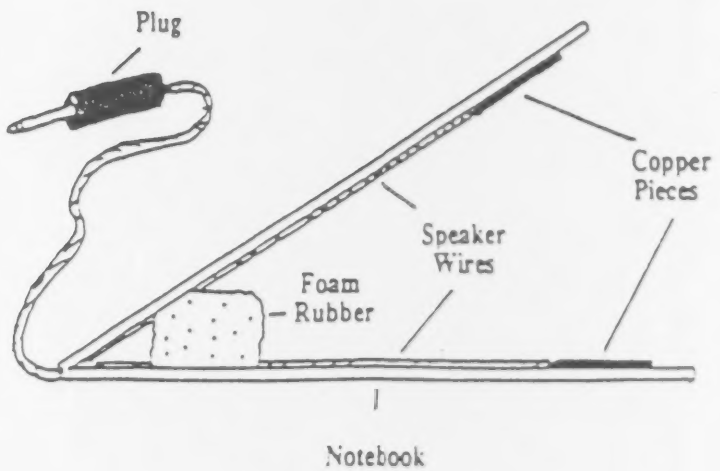
1. Cut two 1" x 2" pieces of copper sheeting.
2. Cut one 3' piece of speaker wire.
3. Split one end of the speaker wire down the middle, the width of the notebook.
4. Solder the wire to the copper pieces. (see How to Solder)
5. Poke a hole in the center of the spine of the notebook the diameter of the speaker wire.
6. Feed the single end of the speaker wire through the hole from inside the notebook.
7. Centered and close to the open end of the covers, hot glue the soldered side of each piece of copper to the notebook; one to the inside front cover and one to the inside back cover. Position so that when the notebook is close, the copper pieces touch.
8. When the copper is secure, pull the speaker wire taunt from outside the hole in the spine of the notebook. Hot glue the wire to the notebook by putting glue around the wire at the hole. Hold till it is secure.



9. Cut a piece of foam rubber 1" x the width of the notebook.

10. Open the notebook and hot glue the foam strip lengthwise and centered to the back cover.

11. Attach a miniature phone plug to the loose end of the speaker wire. (see Attaching the Plug).



Adaptations

User Characteristic	Switch Modification
1. Poorer or finer gross motor skills.....	change the size of the notebook
2. Poorer or greater strength	change the thickness and/or the consistency of the foam rubber

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HOW TO SOLDER

1. Make certain that all the wires, copper, and prongs are clean by rubbing the surfaces to be soldered, with steel wool.

2. Using the wire strippers, remove 1/4" of the plastic coating from the two split ends of the speaker wire.

3. Handling the exposed wires:

   a. When soldering to copper, spread each set of exposed wires out into a small fan shape. Place the fan on the copper with the end of the plastic coating even with the edge of the copper. Solder wires flat to the copper pieces following Step #4.

   b. When soldering wire to a prong with a hole, twist each set of exposed wires to form single strands. Feed the strands through the holes and bend wire back towards the plastic coating.

   c. When soldering two wires together, twist the exposed wires separately, then twist together.

4. Heat for approximately 30 sec. to 1 min. by putting the tip of the soldering iron on the point of connection (where the wire meets the copper or prong). Lightly touch the solder to the point of connection. **Do not use too much solder.** Remove the soldering wire but keep the soldering iron in place until the targeted solder melts into liquid and covers the point of connection. Remove the soldering iron.

5. Test the connection by wiggling it. If the wires move, reheat to separate and being again.

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ATTACHING THE PLUG

1. Unscrew the plug.

2. Thread the end of the wire through the hole in the plug casing. Be sure to feed the wire from the small opening to the large opening.

3. Split the speaker wire down the middle about 3/4" using scissors. Cut one of the halves 1/4" shorter.

4. Using the wire strippers, remove 1/4" of the plastic coating from each half.

5. Individually twist each of the sets of exposed wires to form two single strands. Feed the longer strand into the hole of the shorted prong and the shorter strand into the hole of the longer prong (inserting the wire from the "inside—out"). After the wire is through the hole, bend it back towards the plastic coating. **Be sure that the wire and plastic coating is not buckling. If so, adjust.**

6. Solder each wire at the holes in the prongs. (see How to Solder).

7. Wrap a small piece of electrical tape (approx. 1/2" x 3/4") around the shorter prong enclosing all of the exposed metal, solder, and wire.

8. Using the needle nose pliers, bend the metal points at the end of the longer prong such that they wrap around the speaker wire. **Be sure not to bend so tightly that the ends of the metal points cut into the plastic or electrical tape.**

9. Screw the casing of the plug back onto the plug.

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SERVICE DELIVERY MODELS

Karla A. Sloan, M.A.

&

Pamela D. Smith, Ed.D.

SERVICE DELIVERY MODELS

Karla A. Sloan, M.A. & Pamela D. Smith, Ed. D.

I. INTRODUCTION

A. Children and youth who are provided speech and language services by local school districts may be from three (3) to twenty-one (21) years of age. The speech and language disorder may be the sole handicapping condition, or other handicapping conditions such as a learning disability, a mental handicap, an emotional handicap, a physical handicap, a sensory handicap, or a combination of any of these handicaps may be present.

The service delivery models contained in this outline were developed to assist in the design and implementation of Individualized Education Programs (IEP's) for children and youth, regardless of age, severity of speech and language handicap, or other handicapping conditions.

B. Definition of Terms

Direct services means speech and language services provided by a certified and/or licensed speech-language pathologist (SLP) through direct face-to-face contact with a child or youth.

Indirect services means speech and language services provided by someone other than a certified and/or licensed SLP through direct face-to-face contact with a child or youth under the guidance and supervision of a certified and/or licensed SLP.

II. FOUR (4) BASIC SERVICE DELIVERY MODELS

Direct Service Model
Direct Service plus Teacher's Aide(s) Model
Indirect Service Model
Combination Model

A. Aspects common to all models

1. Speech and language services must be provided under the guidance and supervision of a SLP.

2. Any of the four (4) models may be used to serve children and youth with all ranges of speech-language disorders from mild to severe.

3. Each model may be used to provide services:

   a. in groups or individually
   b. for variable amounts of time per day
   c. for variable amounts of time per week

4. The Admissions and Release Committee (ARC) determines the model of service delivery, the type of service, and the amount of service to meet the needs of each individual.

B. More than one service delivery model will be used by the SLP to meet the needs of children and youth assigned to his/her caseload. Example: Some children and youth may receive all their speech and language services directly from the SLP using the direct model, while other children and youth receive part of their service directly from the SLP with additional services provided by a teacher's aide utilizing the direct service plus teacher's aide model.

C. The ARC may recommend a change in the service delivery model at any time as indicated by needs of the child or youth.

III. DIRECT SERVICE MODEL

A. Historically has been the most frequently used by SLP's in the schools.

Services may be delivered to the child or youth outside his/her classroom in a "speech and language classroom", physically within the child's regular or special classroom, or outside the classroom setting in a community setting.

B. **Personnel:** A fully certified SLP holding a valid teaching certificate and/or license to practice speech pathology.

C. **Role:** Develop, direct and implement the speech and language as a primary service provider.

D. **Responsibilities:**

1. Directs and/or participates in speech and language screening procedures.

2. Participates in Admission and Release Committee (ARC) meetings and as an active member.

3. Performs diagnostic assessment followed by interpretation of assessment data.

4. Refers children and youth to other professionals as warranted.

5. Assists in development of IEP's with the ARC.

6. Delivers speech and language services to children and youth placed in the speech and language program.

7. Consults with classroom teachers.

8. Participates in collaborative teaching with the classroom teacher.

9. Assists in the development of curricula.

E. Provision of Speech and Language Services

The SLP schedules direct contacts with each child or youth based upon the amount, type and location of services listed in each IEP.

F. Accountability

Appropriate data collection methods are used to record on-going progress on a weekly basis. Progress data provides written documentation of the following:

1. Date service is provided. If service is not provided as scheduled, a reason is stated.

2. IEP objective(s) addressed during sessions(s).

3. Student performance information.

G. Components of the IEP

The Admissions and Release Committee (ARC) develops an IEP for each eligible child and youth. The following is specified in the IEP:

1. present level of performance including strengths and weaknesses,
2. annual goals,
3. short term behavioral objectives,
4. primary implementer for each short term objective,
5. amount of time each week which will be utilized for speech and language services,
6. type of service (individual and/or group),
7. where services will be provided (speech-language classroom, regular classroom, special classroom, or in a community setting),
8. specialized materials to be used in the accomplishment of objectives,
9. projected beginning and ending dates for services,

10. projected date for annual review,
11. amount of participation in the regular program, and
12. objective criteria for evaluation of progress.

H. Caseload

Each child or youth who receives direct services is counted on the caseload of the SLP for the purpose of figuring caseload maximum.

IV. DIRECT SERVICE PLUS TEACHER'S AIDE(S) MODEL

A. This model utilizes both direct and indirect services. The SLP provides regularly scheduled direct services to teach new skills and to monitor progress. The teacher's aide(s) provides indirect services by conducting drill and practice sessions to reinforce the skills taught by the SLP. The responsibility for the provision of all speech and language services, direct and indirect, remains with the SLP. For a more detailed description of this model of service delivery, contact the Kentucky Department of Education, Office of Education for Exceptional Children, 8th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601 and request a copy of "Guidelines for the Utilization of Teacher's Aides in Speech and Language Programs".

B. Personnel

1. A fully certified SLP holding a valid teaching certificate and/or a license to practice speech pathology. It is strongly recommended that this professional have a masters degree in the area of speech pathology.

2. Up to two (2) teacher's aides, each of whom meet all the requirements for an instructional teacher's aide mandated by KRS 161:044; (KRS 161:044 is contained in Guidelines for the Utilization of Teacher's Aides in Speech and Language Programs).

C. Role

Speech-Language Pathologist:

The SLP develops, directs and implements a speech and language provider within the guidelines of the employment setting, job description, and in compliance with federal and state regulations of controlling speech and language services.

Teacher's Aide:

The Teacher's Aide frees the supervising SLP from the routine tasks, to allow the SLP to use his/her expertise more effectively in providing intervention services.

D. RESPONSIBILITIES

Speech-Language Pathologist:	Teacher's Aide: (working under the direction of the Speech-Language Pathologist)
1. Identifies and describes speech and language handicaps through diagnostic evaluation, interpretation and report writing.	1. Compiles data associated with testing; completes records and records in-formal observation data.*
2. Plans instructional programs, develops goals and objectives as part of Admissions and Release Committee (ARC).	2. Assists with clerical duties; copies, files, types, transcribes, in an accurate manner.
3. Assesses student progress in IEP goals and objectives.	3. Collects and compiles daily progress data.*

*** NOTE: It is recommended that these duties be performed only after specific training on data collection and compilation have been completed**

4. Takes complete responsibility for instruction of new concepts, skills and each new classroom activity.	4. Reinforces and reviews concepts and skills. Assists students in performing activities initiated by the speech-language pathologist. May conduct screening if specifically trained in utilization of screening instrument(s).**
5. Revises instructional programs.	5. Monitors student progress in programs and relates findings to speech-language pathologist.**
6. Designs instructional materials.	6. Constructs materials as instructed by the speech-language pathologist.

7. Designs and implements behavioral interventions.	7. Monitors and reinforces student performance concerning behavioral interventions through interaction and observation; assumes data collection, compilation, and other record keeping duties.
8. Communicates with parents.	8. Maintains records associated with parent conferencing procedures; fill out and send meeting notices, confirm meeting dates.
9. Attends inservice training training for professionals.	9. Attends inservice training for teacher's aides.
10. Responsible for confidentiality of all records and school related matters.	10. Maintains confidentiality of all records and school related matters.

** **NOTE: It is strongly recommended that these duties only be performed by a teacher's aide who has had additional training and inservice specific to speech and language drill and practice activities as well as a minimum of four (4) months experience as an aide in a speech and language program.**

11. Develops and maintains schedule for service delivery within guidelines and according to needs specified on student IEPs.	11. Assists students in the movement to and from the speech and language room.
12. Responsible for discipline.	12. Disciplines during times when the speech and language pathologist is involved in the regular performance of professional duties or has emergency reasons for being out of the classroom, plays supportive disciplinary role when supervisor is present.

13. Utilizes the written job description of the teacher's aide in assigning duties.

14. Organizes and maintains the classroom or workspace in a safe and efficient manner.

15. Works with the Admissions and Release Committee (ARC) to protect child rights through Due Process Procedures.

16. Supervises in cooperation with any other designated school personnel the performance of assigned duties by the teacher's aide.

13. Assists in nonteaching duties.

14. Participates in on the job training for operating and maintaining audio-visual and other equipment.

15. Knows rights of children through Due Process Procedure (Public Law 94-142).

16. Performs other general duties not prohibited by the job description that will facilitate the delivery of services to the students by the speech-language pathologist.

The delineation of the SLP and teacher's aide duties offered above may be further clarified by the handout entitled "Teacher's Aide Do's and Don'ts" contained at the end of this module.

E. Provision of Speech and Language Services

The SLP schedules direct and indirect contacts with each child or youth based upon the amount, type, and location of services listed in the IEP.

F. Accountability

Appropriate data collection methods are used to record the on-going progress of each or youth on a weekly basis. Progress data provides written documentation of the following:

1. date service is provided. IF service is not provided as scheduled, a reason is stated.

2. IEP objective(s) addressed during session(s), and

3. student performance data.

Progress data is collected and used by both the SLP and the teacher's aide.

G. Components of the IEP

The Admissions and Release Committee (ARC) develops an IEP for each eligible child or youth. The following information is specified in the IEP:

1. present level of performance including strengths and weaknesses,
2. annual goals,
3. short term behavioral objectives,
4. SLP as the primary implementer for each speech and language short term objective(s),
5. amount of time each week to be utilized by the SLP in direct service delivery,
6. amount of time each week to be utilized for indirect services conducted by the teacher's aide under the supervision of the SLP,
7. type of service (individual and/or group),
8. where services will be provided (the speech language classroom, regular classroom, special classroom, or in a community setting),
9. specialized equipment and materials to be used in the accomplishment of objectives,
10. amount of participation in the regular program,
11. objective criteria for evaluation of progress,
12. projected beginning and ending dates for services, and
13. projected date for annual review.

H. Caseload

Each child or youth who receives direct services is counted on the caseload of the SLP for purposes of figuring caseload maximum.

V. INDIRECT SERVICE MODEL

A. A relatively new and emerging role for the SLP in the schools. In this model, the SLP delivers services to children and youth primarily through the classroom

teacher(s). The teacher is provided with training and demonstration in the activities and methods which will be used to stimulate and encourage the practice of appropriate speech and language skills in the classroom and community settings. The SLP is responsible for training the teachers, providing on-going assistance through regularly scheduled indirect service meetings and some direct contact with each student.

Example: Individuals who have severe handicaps, need intensive language stimulation in the natural environment. An appropriate program might be for the SLP to evaluate the speech and language abilities of the child or youth, develop a program of inservice, demonstrate the service program to the teacher(s), parent(s) or significant other(s), periodically work with and observe the student to review progress and insure quality speech and language services.

Four components are vital to the implementation of the indirect model:

1. observation,
2. demonstration,
3. monitoring, and
4. communication.

B. Personnel

1. A fully certified speech-language pathologist holding a valid teaching certificate and/or a license to practice speech pathology

2. Classroom teacher(s)

C. Roles

Speech-Language Pathologist:

The SLP collaborates with teachers parents, and other personnel to develop and implement speech and language goals and objectives to be carried out in the classroom by the classroom teacher(s). The provision of direct and on-going assistance to the teacher in program implementation as well as periodic direct contact with the identified child or youth, are essential components of this role.

Classroom Teacher:

Classroom teacher(s) collaborate with the SLP to develop and implement an intervention plan which will assist in meeting speech and language goals and objectives. The teacher implements the plan as an integrated part of each child or youth's total education program. Providing indirect speech and language services to the identified child or youth for specified amounts of time each week and

collaborating with the SLP during scheduled indirect service meetings are essential components of this role.

D. Responsibilities

Speech-Language Pathologist:

1. Performs diagnostic assessment utilizing formal and informal measures followed by interpretation of assessment data.
2. Reviews records.
3. Participates in Admissions and Release Committee (ARC) meetings as an active member.
4. Assists in the development of IEP's with the ARC.
5. Provides direct speech and language services as directed by the ARC.
6. Meets with the teacher during regularly scheduled indirect service sessions.
7. Refers children to other professionals as warranted.
8. Participants in collaborative teaching with the teacher.
9. Assists in the development of curricula.
10. Consults with parents.

Classroom Teacher(s):

1. Assists in the assessment of speech, language and communication skills.
2. Reviews records.
3. Participates in Admissions and Release Committee (ARC) meetings as an active member.
4. Assists in the development of IEP's with the ARC.
5. Provides regularly scheduled indirect speech and language services provided by the ARC.
6. Meets with the SLP during regularly scheduled indirect service sessions.
7. Participates in collaborative teaching with the SLP.

E. Provision of Speech and Language Services

Speech-Language Pathologist:

The SLP will work with the classroom teacher to schedule a regular time during which:

1. The SLP and teacher will meet to collaborate.
2. The SLP will provide direct service to the identifies child or youth.

Classroom Teacher(s):

The classroom teacher(s) works with the child or youth to provide indirect speech and language services with guidance from the SLP. The ARC will determine the amount of time the teacher(s) will schedule for indirect service meetings with the SLP.

F. Accountability

Speech-Language Pathologist:

The SLP will keep a record of contacts with the teacher including:

1. date,
2. discussion content,
3. suggestions,
4. specific IEP objectives addressed,
5. changes in student performance, and
6. materials constructed or provided.

Classroom Teacher(s):

The classroom teacher, as a primary implementer, will utilize appropriate data collection methods to record on-going progress on a weekly basis. Progress data provides written documentation of the date that services were provided. If services cannot be provided as scheduled, a reason is stated.

G. Components of the IEP

1. present level of performance including strengths and weaknesses,
2. annual goals,
3. short term behavioral objectives,
4. SLP as the secondary implementer for speech and language short term objectives,
5. amount of time to be utilized by the SLP in direct service delivery,
6. amount of time each week to be utilized for indirect services conducted by the teacher,

7. type of service (individual and/or group),

8. where services will be provided; the speech and language classroom, regular classroom, special classroom, or in one or more community settings,

9. specialized equipment and materials to be used in the accomplishment of objectives,

10. objective criteria for evaluation of progress,

11. amount of participation in the regular and special education programs,

12. projected beginning and ending dates for service, and

13. projected date for annual review.

H. Caseload

The child or youth who receives services through the indirect model is counted on the caseload of the SLP if all of the following conditions are met.

1. The child or youth receives regularly scheduled indirect services from the classroom teacher as determined by the Admissions and Release Committee (ARC).

AND

2. The SLP has regularly scheduled indirect service meetings, with the teacher who is providing the indirect service, at least once per month for a minimum of 20 minutes.

AND

3. The indirect service meetings are held for the purpose of developing, discussing, demonstrating and evaluating activities which are specific to the child or youth and relate to speech and language objectives listed on the IEP.

AND

4. The SLP has regularly scheduled direct contact with the child or youth at least once per month for a minimum of 20 minutes during demonstration, observation, and/or intervention activities.

VI. COMBINATION MODEL

A. An individual student may be provided with the most appropriate service through the use of more than one of the models simultaneously.

1. Direct and Indirect

2. Direct, Indirect and teacher's aide

B. Persons who can provide speech-language services

1. Fully certified speech-language pathologist holding a valid teaching certificate and/or license to practice speech pathology.

2. Classroom teacher(s) (indirect)

3. Teacher's aide (if A. 2. is selected). Must meet all the requirements for an instructional teacher's aide mandated by KRS 161:044. (KRS 161.044 is located in Guidelines for the Utilization of Teacher's Aides in Speech and Language Programs.).

C. Roles:

1. Speech-language pathologist:

a. Direct and implement the speech and language program as a primary service provider AND collaborate with teachers, parents and other personnel to develop and implement speech and language objectives to be carried out by the classroom teacher(s) in the classroom or community setting.

b. Provision of direct and on-going assistance to the classroom teacher.

c. Training and supervision of teacher's aide if combination A.2. is selected.

2. Classroom teacher(s)

a. Collaborates with the SLP,

b. Implements intervention plan as integrated part of the total IEP, and

c. Provides indirect speech and language services in the classroom or community setting.

3. **Teacher's aide** (if option A. 2. is selected): Completes routine clerical and drill and practice activities to allow the supervising SLP to use expertise more effectively in providing intervention services.

D. Responsibilities

Review responsibilities listed under each of the models being combined. All will apply to personnel involved in service provision.

E. Scheduling Speech and Language Services

1. The SLP schedules:

   a. direct service,
   b. indirect service meetings with the classroom teacher(s), and
   c. indirect service provided by a teacher's aide (if option A. 2. is selected).

2. The classroom teacher(s) schedules:

   a. indirect service she/he will provide, and
   b. indirect service meetings with SLP.

3. Teacher's aide provides indirect service as scheduled by SLP (if option A. 2. is selected).

F. Accountability

1. The speech-language pathologist:

   a. will keep a record of contact with the teacher,
   b. monitor ongoing progress in the provision of direct service, and
   c. review ongoing progress data collected by the classroom teacher(s) and teacher's aide(s).

2. The classroom teacher(s) will:

   a. collect ongoing progress data during indirect service provision,
   b. review ongoing progress data collected by the SLP and teacher's aide, and
   c. review notes from indirect service meeting with the SLP.

3. Teacher's aide will collect on-going progress data during indirect service provision.

G. Components of the IEP

The Admissions and Release Committee (ARC) develops an IEP for each eligible child or youth. The following is specified in the IEP:

1. present level of performance including strengths and weaknesses,
2. annual goals,
3. short term behavioral objectives,
4. SLP as the secondary implementer for speech and language short term objectives,
5. amount of time to be utilized by the SLP in direct service delivery,
6. amount of time each week to be utilized for indirect services conducted by the teacher,
7. type of service (individual and/or group),
8. where services will be provided (the speech and language classroom, regular classroom, special classroom, or in one or more community settings),
9. specialized equipment and materials to be used in the accomplishment of objectives,
10. objective criteria for evaluation of progress,
11. amount of participation in the regular and special education programs,
12. projected beginning and ending dates for service, and
13. projected date for annual review.

H. Caseload

Each child or youth who receives direct services is counted on the caseload of the SLP for the purpose of determining caseload maximum.

VII. CASELOAD SIZE FOR SPEECH-LANGUAGE PROGRAMS IN SCHOOLS

A. The caseload for a speech-language pathologist is composed of those children and youth determined by the Admissions and Release Committee (ARC) to have a speech and/or language disorder which adversely affects educational performance. The number of children and youth on any one caseload is determined by the individual SLP and local school administrators. See the handout entitled "Caseload Worksheet" at the end of this module.

B. Considerations in determining caseload size

1. severity of speech, language and communication disorders,
2. extent of direct and indirect service to be provided,
3. possible grouping,
4. other duties and responsibilities of the SLP, and
5. numbers of contact hours available for provision of direct and indirect services.

VIII. CONCEPTS RELATED TO TEAM SERVICE DELIVERY FOR STUDENTS WITH SEVERE AND MULTIPLE HANDICAPS

A. Transdisciplinary Services

In providing speech-language services to students with severe and multiple handicaps, a transdisciplinary approach to service delivery is recommended. Transdisciplinary services differs from other team models such as multidisciplinary and interdisciplinary. In the transdisciplinary approach, therapists work closely with other team members to allow instructional goals to be integrated across the day and to be taught in real-life settings. Using this approach the speech-language pathologist and other related services personnel (e.g. physical and occupational therapists) work cooperatively with the special education teacher and parents in designing and implementing educational programs. The overall major educational goals for the child or youth provides the framework for assessment of communication needs and provides the context for which instruction will occur. Consult Smith (1990) for additional information on providing transdisciplinary services and integrating therapy.

Transdisciplinary service delivery relates to both the indirect and direct models of service delivery. It does not mean that therapists stop providing direct services. It does mean that therapists provide both direct and indirect services in natural settings and assure that those services are directly related to the student's overall educational program. The transdisciplinary team approach incorporates four basic assumptions:

1. Assessment of basic abilities and skills (e.g. communication, motor, sensory) can be best conducted in natural environments.

2. Students should be taught clusters of basic skills through play, daily routines, and functional activities (those needed in every day life).

3. Intervention should be provided throughout the day and in all settings in which the student functions.

4. Skills must be taught in the settings in which they occur naturally.

As these relate to speech-language intervention, it becomes evident that speech-language pathologists can stop spending time deciding what the expressive vocabulary needs are for communication. If we begin to work together using a collective set of goals for a student and these four assumptions, the vocabulary needs of the student will become clear. These needs are based on functional skills and environmental demands (e.g. daily routines, activities, settings). Refer to the modules on assessment and intervention where these concepts are well integrated.

B. Role Release

Role release is a key component in transdisciplinary service delivery. "Role release" refers to sharing or releasing a role or responsibility to another team member. This is done after training and consultation has occurred with that other team member. Through role release we can teach others how to implement procedures or instruction so that students can begin to receive intervention throughout the day. Role release works across all team members. The speech-language pathologist may need to learn some techniques from the teacher and/or physical or occupational therapist to work with individual students.

C. Integrated Therapy or Integrated Programming

Integrated therapy is a natural outgrowth of transdisciplinary service delivery. Therapy services (e.g. speech, OT, PT) are provided in functional contexts in natural settings (both direct and indirect). These services may be provided in activities in the classroom, around the school (e.g. lunchroom, library, gym). and in the community.

In order to accomplish this, therapists need to consider block scheduling for students with severe and multiple handicaps. In block scheduling, the therapist(s) change their schedules from several, short sessions each week (e.g. 30 minutes 2 x per week) with individual students to longer, less frequent sessions (e.g. 60 minutes 1 x per week) to allow for time to observe and work with the student in actual activities and settings. This also allows the therapist to "block schedule" their time with specific classrooms where he/she serves several students. Consult Rainforth and York (1987) for more examples of block scheduling.

D. Assessment of Team Programming

Typical school routines and activities provide countless opportunities for providing integrated direct therapy and for reinforcing therapy (indirect). To assess your level of providing transdisciplinary services and integrated therapy, ask yourself these questions (Rainforth, 1989).

1. Do you assess students in the context of functional activities and daily routines?

2. Do you provide therapy in the context of these activities?

3. Do you work with the teacher and other team members to identify priorities within these activities?

4. Do you teach others to use intervention methods while working with students in these activities?

5. Do you work with other team members to identify opportunities and methods to teach students to use clusters of skills (e.g. the overall goals)?

If you answer no to any of these questions, begin a dialogue with your special education coordinator, teachers, and other team members to develop strategies for initiating and/or improving transdisciplinary services and integrated therapy (see Smith, 1990 for implementation strategies).

Recommended Readings and References

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TEACHER'S AIDE DO'S AND DON'TS

The Teacher's Aide May:	The Teacher's Aide May Not:
1. Be left alone in the classroom; however, the SLP remains responsible for the classroom. The school principal for other designated school personnel shall be responsible for the direct supervision of the aide, if the SLP is not in the school building.	1. Be used as a substitute for a certified/licensed speech-language pathologist.
2. Have specific instructional and management responsibilities for students.	2. Be given primary responsibility for working with an individual or small groups of student(s).
3. Be in attendance at Admissions and Release Committee (ARC) meetings.	3. Be assigned to attend Admissions and Release Committee (ARC) meetings in lieu of the speech-language pathologist.
4. Conduct drill and practice activities to reinforce concepts introduced by the speech-language pathologist.	4. Be responsible for preparing lesson plans and initiating original concept instruction.
5. Monitor student progress and relay information to the speech-language pathologist.	5. Prepare official progress reports.
6. Assist in speech and language screening procedures.	6. Administer diagnostic speech-language assessments and/or interpret test results.
7. Assist other special education teachers as directed by the supervising speech-language pathologist.	7. Be used to perform other school tasks not related to the special education classroom or special education students.

8. Fill out and send meeting notices and make phone calls to confirm meeting dates.

9. Collect and compile daily progress data.

10. Compose written progress notes following drill and practice sessions.

8. Communicate with parents unless under the direction and supervision of the speech-language pathologist.

9. Responsible for the establishment of IEP goals and objectives.

10. Compose formal clinical reports.

11. Determine eligibility and need for special education services.

12. Interpret observation or diagnostic data related to clinical management strategies or procedures.

13. Transmit clinical information to anyone other than the professional.

14. Refer a child or youth to other professionals.

15. Use any title other than that stated in the job description.

K.A. Sloan (1988)

CASELOAD WORKSHEET

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00					
8:30					
9:00					
9:30					
10:00					
10:30	T R A V E L T I M E				
11:00	P L A N N I N G T I M E				
11:30	L U N C H				
12:00	P L A N N I N G T I M E				
12:30					
1:00					
1:30					
2:00					
2:30					

K.A. Sloan (1988)

Caseload Worksheet: Instructions

STEP 1

a. Determine the possible number of sessions per week as dictated by the schools schedule.

b. Determine the number of sessions which must be reserved each week for:

lunch	_____
travel	_____
planning	_____
supervision of a teacher's aide	
diagnostic	_____
ARC meetings/parent/teacher contacts	_____
sub total	_____

c. Subtract the subtotal in b from the possible number of sessions in a. This will provide you with the total number of instructional sessions available per week.

STEP 2

Determine group size (column b) and number of sessions per week (column c).

A	B	C	D	E
Num. Stud.	Session Group Size	No. Groups per week	Number Stud-Group Size	No Sessions Sess. x No. per Week Grps.

STEP 3

Divide column a by column b to get column d (number of groups).

Multiply column c by column d to get column e (number of sessions per week).

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APPENDIX A:

AGENDA

AND

EVALUATION FORMS

COMMUNICATION PROGRAMMING FOR STUDENTS WITH SEVERE AND MULTIPLE HANDICAPS

Day 1

8:00 - 8:30	Registration, Completion of Survey & Pretest	Pam Smith
8:30 - 9:00	Welcome, Orientation	Pam Smith
9:00 - 9:30	Definition and Characteristics of the Population	Jane Kleinert
9:30 - 10:00	Service Delivery Models	Karla Sloan
10:00 - 10:15	Break	
10:15 - 12:00	Assessment Strategies	Jane Kleinert
12:00 - 1:00	Lunch (provided)	
1:00 - 2:15	Intervention Strategies & Program Planning	Jane Kleinert
2:15 - 2:30	Break	
2:30 - 4:00	Intervention Strategies (con't)	Jane Kleinert
4:00 - 4:30	Description of "Plan of Action" (Day 1 Evaluation)	Jane Kleinert

Evening Assignment: Development of individual "plan of action" by each participant for a student with whom he/she is presently working

Day 2

8:00 - 8:15	Questions/Discussion	Pam Smith Jane Kleinert
8:15 - 9:45	Augmentative Communication Systems	Judy Page
9:45 - 10:00	Break	

10:00 - 11:30	Augmentative Communication (con't)	Judy Page
11:30 - 12:00	Video Tapes of Students: Discussion of Communication Needs	Jane Kleinert Judy Page Pam Smith
12:00 - 1:00	Lunch (provided)	
1:00 - 2:00	Special Considerations for Students with Motor Disabilities (switch/device mounting and positioning techniques)	Pam Smith
2:00 - 2:30	Break	
2:30 - 3:30	Make & Take: Homemade Switches	Cindy George
3:30 - 4:00	Posttest, Workshop Evaluation, CEU form, Expense Vouchers	Pam Smith

SPEECH/LANGUAGE SERVICES FOR STUDENTS

WITH SEVERE AND MULTIPLE HANDICAPS

Administrator Session

10:00 - 10:20	Welcome, Overview of Kentucky Statewide Systems Change Project for Students with Severe Handicaps	Pam Smith
10:20 - 11:00	Overview of Training for Speech/Language Pathologists (strategies & resources)	Pam Smith
11:00 - 11:15	"TALK is Not a Four Letter Word" (alternatives to spoken language)	Video Tape
11:15 - 12:00	Caseload Issues: Scheduling and caseload maximums	Karla Sloan
12:00 - 1:00	Lunch (provided)	
1:00 - 2:00	Options for the Delivery of Speech and Language Services	Karla Sloan

Presenters: Pam Smith, Ed.D.
Associate Director, Kentucky Systems Change Project
Interdisciplinary Human Development Institute
University of Kentucky

Karla Sloan, M.A.
Former Consultant, Communication Disorders
Kentucky Department of Education
Office of Education for Exceptional Children

COMMUNICATION PROGRAMMING: PRE- & POSTTEST

Last 4 Digits of Phone # _____

1. How can parallel programming be used in augmentative communication?

2. List three types of direct selection.

3. Describe three nonelectronic toy adaptations.

4. Describe a technique for moving a student to a more abstract symbol system.

5. List the 4 components of single switch assessment.

   M =

   S =

   I =

   P =

6. Define briefly the following:

   Perlocution -

   Illocution -

   Locution -

7. List 5 examples of communicative intents.

8. What considerations must be taken prior to "extinguishing aberrant behaviors in a nonverbal child?

9. Why might an occupational therapist, physical therapist, and special educator be involved in some stages of communication programming for students with severe or multiple handicaps.

10. Why might the speech/language pathologist be involved in community-based instruction.

SPEECH PATHOLOGIST SURVEY

Please circle the number for each of the items.

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

	SD	D	N	A	SA
1. I feel comfortable programming for students with severe motor disabilities.	1	2	3	4	5
2. Five-year-old students with severe handicaps should participate in many regular school/classroom activities.	1	2	3	4	5
3. Families that are really interested in their child with handicaps will initiate contact with teachers and therapists frequently.	1	2	3	4	5
4. Most students I know who have severe or multiple handicaps do not communicate.	1	2	3	4	5
5. Nonhandicapped students can learn just as well when there are one or two students with severe handicaps in the room.	1	2	3	4	5
6. Speech pathologists should spend most of their direct therapy time working with a student with severe or multiple handicaps in the child's classroom, the community or other typical settings.	1	2	3	4	5
7. Often parents do not do enough for or with their child with severe or multiple handicaps.	1	2	3	4	5
8. Students with severe handicaps learn very little in a group setting and primarily require one-on-one instruction.	1	2	3	4	5
9. A good speech pathologist works directly with the family/parent as well as with the student with severe handicaps.	1	2	3	4	5
10. There is less time to teach students with severe handicaps because the day is taken up by feeding, diapering, etc.	1	2	3	4	5
	SD	D	N	A	SA

		SD	D	N	A	SA
11.	At school, services for students with severe handicaps can best be provided in a classroom with other students having severe handicaps.	1	2	3	4	5
12.	Students with multiple handicaps should see as many specialists (OT, PT, etc.) as possible on a regular (e.g. weekly) basis.	1	2	3	4	5
13.	Parents can tell you pretty accurately what their child with severe handicaps can and cannot do.	1	2	3	4	5
14.	A PT can provide quality PT services without visiting the classroom or home because the exercises can be done anywhere.	1	2	3	4	5
15.	I enjoy visiting parents in the home and learning from them.	1	2	3	4	5
16.	At school, students with severe handicaps should spend most of their time with their nonhandicapped peers.	1	2	3	4	5
17.	Students having severe/profound handicaps should receive regular services from the SLP.	1	2	3	4	5
18.	Students having severe/profound handicaps have potential for developing some forms of communication.	1	2	3	4	5
19.	Students having severe/profound handicaps could be integrated into S/L stimulation or sessions with "regular education" students.	1	2	3	4	5
20.	Speech/language pathology services are best spent with students who have good potential to use oral speech.	1	2	3	4	5
21.	Speech/language pathologists should at times accompany his/her students in community-based instruction (CBI).	1	2	3	4	5
22.	Students having severe/profound handicaps are best served by consultation only with the classroom teacher.	1	2	3	4	5

	SD	D	N	A	SA
23. Students having severe/profound handicaps cannot really benefit from group S/L treatment activities.	1	2	3	4	5
24. Speech/language of students with severe/profound handicaps are quite similar for all students.	1	2	3	4	5
25. Speech/language goals for students with severe/ profound handicaps should be student based.	1	2	3	4	5
26. Physical and sensory disabilities, often mask communication attempts.	1	2	3	4	5
27. Aberrant behaviors often have a communicative intent.	1	2	3	4	5
28. If an elementary or secondary student with severe handicaps is functioning at very early levels cognitively, it is okay to use infant toys and games.	1	2	3	4	5
29. A communication system that is understandable by a student's family and teacher but not by the general community is usually sufficient for students with severe handicaps.	1	2	3	4	5

EVALUATION SUMMARY: Administrator Training Sessions

Role:

13	Special Education Director/Supervisor
3	Special Education Consultant
5	Speech/Language Services Coord./Supervisor
10	Principal (4 all ages, 5 elementary, 1 secondary)
4	Other (2 coop directors, 1 child find coordinator, 1 adult services)
35	Total

Scale: 7 = high/excellent to 1 = low/poor

Item	Average	Range
1. The organization of today's content was:	6.6	6-7
2. The activities (i.e. lecture, discussion) today were:	6.3	5-7
3. The media used today were:	6.2	5-7
4. The objectives to today's content were:	6.5	6-7
5. The scope of today's content was:	6.4	6-7
6. The work of the presenters today was:	6.6	6-7
7. My attendance today should prove:	6.4	6-7

8. The stronger features today were: (rank order)

   1 - Knowledge and organization of the speakers.

   2 - Very informative information and handouts.

9. The weaker features today were: (rank order)

   1 - Not enough time.

   2 - More administrators should have attended.

10. General comments: (rank order)

    1 - Very good, presenters very knowledgeable.

    2 - Very informative, excellent overview.

EVALUATION SUMMARY: Day 1

Scale: 7 = high/excellent to 1 = low/poor (N = 98 speech/language pathologist)

Item	Average	Range
1. The organization of today's content was:	6.14	4-7
2. The lectures today were:	6.36	4-7
3. The media used today were:	5.64	1-7
4. The participant activities today were:	5.34 (n/a)	3-7
5. The objectives to today's content were:	6.22	4-7
6. The continuity and consistency of the sessions today were:	6.14	4-7
7. The scope of today's content was:	6.18	4-7
8. The work of the presenters today was:	6.56	4-7
9. My attendance today should prove:	6.26	4-7

10. The stronger features today were: (rank order)

    1 - Good visual aids, use of different media.
    2 - Well written manual with lots of references.
    3 - Ideas to take from assessment to treatment, lots of good examples.
    4 - Knowledgeable presenters, interesting.

11. The weaker features today were: (rank order)

    1 - Too much information in short time, not enough time to spend on each section or for questions.
    2 - Tapes and overhead projections difficult to see/read from back of room, could not hear some of the video tapes.

12. General Comments: (rank order)

    1 - Thank you, it was enjoyable. Great! Super! Excellent!
    2 - Overall, this workshop is very good and helpful. Useful information.
    3 - Workshop was very informative, interesting, and well organized.

EVALUATION SUMMARY: Day 2

Scale: 7 = high/excellent to 1 = low/poor (N = 98 speech/language pathologist)

Item	Average	Range
1. The organization of today's content was:	6.54	4 - 7
2. The lectures today were:	6.54	4 - 7
3. The media used today were:	6.50	4 - 7
4. The participant activities today were:	6.64	3 - 7
5. The objectives to today's content were:	6.56	5 - 7
6. The continuity and consistency of the sessions today were:	6.52	3 - 7
7. The scope of today's content was:	6.50	4 - 7
8. The work of the presenters today was:	6.70	4 - 7
9. My attendance today should prove:	6.46	4 - 7

10. The stronger features today were: (rank order)

    1 - Making switches, ideas for switches and boards.
    2 - Hands on approach, see materials.
    3 - Group activity and demonstrations with students on video tapes.
    4 - Quality speakers, information organization and expertise of presentors.

11. The weaker features today were: (rank order)

    1 - Need more time, not long enough.
    2 - Too much information to absorb.

12. General Comments: (rank order)

    1 - Great, thanks for opportunity. Invaluable to my profession, more confidence in dealing with this population. Very, very helpful, useful information.
    2 - By far, best workshop I have ever been to. You all are top notch people.
    3 - Excellent, well organized.

OVERALL EVALUATION SUMMARY: Speech-Language Pathologists

(Participant comments are ranked in order of frequency of responses.)

Aspects of the workshop that were MOST helpful to participants:

1 - Organized take-home book. Materials, videos, and manual.

2 - Making a switch device.

3 - Section and information on augmentative devices.

4 - Lots of real examples.

5 - All aspects very helpful. Everything.

6 - Great overview of assessment.

Aspects of the workshop that were LEAST helpful to participants:

1 - Do not work with low functioning students. Need information on higher functioning individuals and older. (Although participants were selected due to their work with students with severe and/or multiple handicaps, we found that many students with the most severe handicaps were not being served and/or the therapist's definition of "severe" handicaps was much higher functioning than the trainers. The Kentucky System Change project is addressing this issue at the state policy level related to speech-language services.)

2 - Limited time.

Overall recommendations/comments regarding this workshop:

1 - Good! Great! Excellent!

2 - There was too much to cover in such a short period of time. Allow for more time.

3 - Continue to offer workshops like this. Hands on experience is great. Mix in more hands on activities to support lectures.

APPENDIX B

A PLAN OF ACTION

PLAN OF ACTION

At the beginning of the module on assessment, you were encouraged to be thinking of one specific student with whom you are working and for whom the material in this manual would be most useful. Hopefully, you collected some information that will help you begin to focus more clearly on this student's current needs in the area of communication. You should develop a "Plan of Action" to attack this student's communication needs. The plan should include the elements on the next pages. Use the space provided for your responses.

This is not a test. There are NO right or wrong answers. It may only involve looking at what you want to do to develop a comprehensive communication program for your student and listing these things out with a projected date for completion for each. Be realistic. How much really can be done with the amount of time your caseload allows for this student? Could data be collected on several students in the same class during a series of visits? Rather than taking detailed systematic sampling, could you do some abbreviated version of such a system? Is there anyone in the class who might help collect such data (e.g. teacher aide)? Do you have any student clinicians who can help in such important evaluative data collections? Could you devise a short questionnaire for the classroom teacher, OT/PT, aides, and parents which could give you information regarding whether a student seems to communicate in any way? How does he/she do this? What things or activities does he/she REALLY LIKE? What does he/she dislike? What are other team members most important concerns about communication development for this student--What do they want him/her to be able to do? Remember: Don't tell us what a student can't do - look for what he/she <u>can</u> do and go from there!

***NOTE: This "Plan of Action" Activity was used for the evening assignment at the conclusion of Day 1 of the two-day workshop for SLP's. For those SLP's in the Kentucky Systems Change Project districts, follow-up consultation will be provided to regarding your students. Your "Plan of Action" will be passed on to the follow-up person and your progress will be one of the focal points of the follow-up visit. Let us know what worked and just as importantly, what did not. We need and value your input, so that we all continue to learn from each other and from our students.**

A PLAN OF ACTION

Instructions

1. Describe the student.

2. Current Communication Program: Simply describe what are the goals for communication development right now.

3. What evaluation procedures are needed to better determine communication goals for this student? From the information you received today, what are major sets of information you need to accumulate on this student before making any further program recommendations?

4. Who will participate in the overall information gathering and program development for this student? Simply list who should be involved in all aspects of the evaluation, directly or indirectly.

5. Whose concerns and wishes do we need to consider in the communication program development?

6. Where will your observations and evaluations take place?

7a. What specialized area of abilities will you as the SLP need to assess and observe? What areas of this student's development and functioning will you need to discuss with others?

7b. Are there any "interfering systems" which may be masking the student's abilities? Who can help you with these problems?

8. What outside information (if any) do you need to obtain? Are there problems that should be handled by outside agencies or individuals, such as medical, etc.?

9. What specialized areas of treatment might benefit your student that can be offered by other personnel within your school system? Are there any questions you can already list that you need to discuss with these people?

10. Are there any adaptive/assistive devices that should be investigated, funding sources, technologies to be explored that would benefit this student? Who could you contact to access this information? (See modules labeled "Augmentative" and "Switches" and Appendices E, F, G, and H for further information).

11. Are there any immediate changes in programming you could begin to employ right away? E.g. peer interactions, adaptive devices already available in your district, new environments into which you can accompany your student or for which you can design programs for, any other personnel in your student's environment who might enjoy being part of the communication program (e.g. would the bus driver agree to make it a point to greet the student in a specific way each time he/she gets on and off the bus); could some or all of your current goals for this student be adapted into the 4 domains of daily life and into the classroom's activity based curriculum?

APPENDIX C

OBSERVATIONAL ASSESSMENT SUMMARY AND INTERVENTION PLANNING FORM

Observational Assessment Summary and Intervention Planning Form

*This is a summary of the entire continuum of assessment presented in this manual. Obviously one selects only the range of skills within the abilities of a particular student, and deletes sections which are too high or too low.

Student's Name_____

Date_____

Evaluator_____

What student can do: (describe behaviors)	**What stimuli elicited responses? (sensory input modes)**	**Expressive Output (describe behaviors observed):**	**Possible Goals**	**Strategies Suggested**
Alerted: (consider all sensory stimuli)				
Awareness/Reaction: (consider all senses)				
auditory				
visual				
tactile				
movement				
taste				
smell				

	What stimuli elicited responses? (sensory input modes)	Expressive Output (describe behaviors observed):	Possible Goals	Strategies Suggested
Engagement: (consider all senses)				
length of engagement				
position of student and stimuli				
what terminated the engagement				
Anticipatory Behaviors:				
Levels of Performative Acts:				
perlocution				
illocution				
locution				

	What stimuli elicited responses? (best recep. modes)	Expressive Output (describe behaviors observed):	Possible Goals	Strategies Suggested
Communitative Intents Displayed:				
Type of Expression:				
initiation				
response				
imitation				
Level of Turn-Taking:				
vocal contagion				
mutual imitation				
spontaneous imitation within repertoire				
spontaneous imitation of a novel stimuli				

	What stimuli elicited responses? (best recep. modes)	Expressive Output (describe behaviors observed):	Possible Goals	Strategies Suggested
question-answer (adult to student)				
question-answer (student to adult)				
Amount & type of Conversational and Pragmatic Rules Violated (if any):				
Comprehension of: verbal				
gestural				
real items				
miniatures				
pictures (describe type)				
graphics (types)				
actions (verbs)				

	What stimuli elicited responses? (best recep. modes)	Expressive Output (describe behaviors observed):	Possible Goals	Strategies Suggested
textures				
sign (type of system)				
print (describe type)				
BLISS				
REBUS				
Braille				
Other (s)				

Describe Characteristics	Expressive output Describe behaviors observed	Possible Goals	Strategies Suggested
Indicating Behaviors: eye point/gaze			
pointing (arm/hand)			
verbal			
write/ print			
keyboard			
signalling device			
switch use			
scanning abilities			
formalized system of communication			
any combination of the above			

Describe Characteristics	Expressive Output (describe behaviors observed):	Possible Goals	Strategies Suggested
Results of Formalized Testing: speech/language			
cognition			
other (OT, PT, etc.)			

Areas in need of further specialized evaluation (e.g. feeding, voice, respiration etc.):

What, where and with whom did communication occur?	Domains			
	Domestic	Community/ School	Vocational	Recreation/ Leisure
Opportunities for Integration with Nonhandi-capped Peers:				
Classroom Goals in Each Domain:				
Communication Skills Needed to More Fully Participate in Each Domain:				

Interfering Systems

Sensory (describe each type)	**Strength (Facilitating)**	**Weaknesses (Inhibitory or distracting)**
auditory		
vision		
touch/tactile		
movement		
smell		
taste		
Motor		
muscle tone		
associated reactions		
abnormal patterns and reflexes		
parts of body involved		

Input of Physical Therapist:

Positioning

Handling

Gross Motor

Goals PT requests to be reinforced by the entire team

Input Of Occupational Therapist:

Movement

Tactile

Positioning

Handling

Fine Motor

Self-Care

Goals OT requests to be reinforced by the entire team

Parental/Family: Most important needs/goals family has for student.

Student: Most important needs/goals student has for himself/herself.

APPENDIX D

CASE STUDIES*

*NOTE: These are sample assessment/intervention programs. Some have been collapsed or reduced from their original form. Any suggestions provided in the areas of feeding, positioning or handling were made specifically for the child being discussed, and are <u>not</u> to be generalized to other children. Such programs are to be made specifically for each student by a team of specialists.

Report #1

C.A. = 2 years 4 months; functioning at a severe/profound cognitive level, enrolled in parent-infant program

Intensive Speech-Language Therapy in the following areas:

a. Increase attending to input-social contact. Consider following Van Dijk's co-active movement communication program as described in a prelanguage curriculum guide for the multiply handicapped (see resource at end of report). This would appear an excellent (an inexpensive) program for this child.

b. Imitate her actions/sounds to gain her attention and begin social interaction.

c. Find activities she really loves. Do these with her, then stop, does she do anything to get you to continue. Use anything she does as a request and increase that requesting power. INTERPRET her output as meaningful.

d. Find things she loves to play with, eat etc. Let her have or play some. Then ask her "do you want more?" Physically assist her to sign "more", and immediately say "more" as you give her more. Modify the more sign to a clap so it is easier and gives her more sensory (tactile/kenesthetic) feedback.

e. Work on having her wave hi/bye in play where you hide your face and each time you reappear (e.g. cover face with a cloth, pull it off,) say and wave "hi", then hide, and say and wave "bye".

f. When she really wants something you have, and she reaches for it - help her to sign want (adapt sign so it is her hand tapping against her chest which is easier and has more tactile/kinesthetic feedback). Ask her "Do you want _____? Show me what you want." Help her sign and then immediately give it to her.

g. Use mutual imitation and melodic intonation to increase her speech (see attached definitions) also "gaming" activities. Use simple words that describe your play activities with her.

h. Pick 5 activities she does every day. e.g. diaper change, wash hands, drink, eat, play. Everytime these occur use the same words to describe the event and emphasize all sensory feedback systems. For example, diaper changing, take her with you to get the diaper. Let her see, feel, and smell the clean diaper. Rustle it so she hears its sound. Say the word "diaper" or the phrase "now we'll put on diaper" over and over. Take her with you to "throw away diaper." Let her help. Do these activities the same way over and over. Look for her to begin to anticipate what's coming from the words you use. (This means receptive language is developing.)

i. Increase her response and understanding of sounds. Listen to knock at door, open door, child gets kiss/hug from mom who's behind door. Listen to toilet flush or bath water running then go see where it is. Does she begin to anticipate what a sound means.

j. Call her name, if she looks or comes she gets a taste of a favorite food.

k. Play up/down games - each time you pick her up she must raise her arms (you help at first). This will gradually become a request for "up". Be sure to say the word over and over with a rising inflection in your voice.

l. Increase cognitive skills.

1. Tool use, object permanence, object identification, and functional use of items (e.g. throw a ball, scribble with pencil, drink from cup, put shoe to foot etc. rather than mouthing, or throwing or just dropping things).

2. Pick 5 objects to play with (e.g. cup, ball, shoe, car, drink). Name them as you show her how to use them. Help her imitate you. Say and do this over and over. Does she find the one you name? Does she begin to know how to use it.

3. Obtain books on how to develop simple switches to turn on battery operated toys. Show and help her to push the switch and see the toy "go". This is a good tool use activity.

4. Child Guidance Pop-N-Pal, a jack in the box etc. are good tool use toys. Also try placing her in a wagon and "go go go", then stop and put handle near her. If she touches it , or shows in some way that she wants to "go" accept that as communication and reinforce it by saying "Oh, you said go".

5. Obtain Prattle and Play by Musslewhite. Try "Prattle" activities, e.g. put out a few toys. When she picks one say "Oh, you want cup. You said cup". Sign it and say it for her. Next replace the toys with pictures of the same things. When she touches one say "Oh, you said cup. You must want cup - here it is" and give her the toy that corresponds with the one she touched.

m. When child can do tasks as described above begin working on vocabulary and language concepts in a developmental order and in occurrence with naturally occurring contexts, and opportunities. e.g. body parts, clothes, favorite toys, following simple directions look, get, give, put, stand, sit, eat, go etc.); where's momma?

***NOTE: Before beginning any learning activity, be sure child is positioned in a stable manner. She has postural instability and balance which will make it difficult for her to attend to tasks. Consult OT or PT for positioning and input (e.g. tactile/kinesthetic activities) which would help increase her posture stability and attending-and therefore learning and vocalizations.**

n. Oral Motor: Child needs an oral tactile program to normalize sensitivity, improve tongue bowl, improve chewing conducted by OT or NDT trained SLP. Obtain Mother Care spoon and improve cup drinking and spoon feeding as directed on attached sheet.

Suggested Curriculums for Communication Programming

A Prelanguage Curriculum Guide for the Multihandicapped. The Colorado School for the Deaf and the Blind. Kiowa and Institute Streets. Colorado Springs, Colorado 80903 (Based on Dr. Jan Van Dijk's co-active movement approach.)

0 to 3 years: An Early Language Curriculum. Carole Perdlick and Melanie Herzfeld. Linguisystems Suite 806, 1630 Fifth Ave. Moline, IL 61265. (309) 762-5112.

Communication Training Program. Carol L. Waryas and Kathleen Stremel-Campbell. Teaching Resources. 50 Pond Park Rd. Hihgham, Mass. 02043.

Infant Learning. Carl Dunst. Teaching Resources. 50 Pond Park Rd. Hingham, Mass. 02043.

Teaching Your Down's Syndrome Infant (1977). Marci Hanson, University Park Press, Baltimore.

The Signed English Dictionary (1975). Gallaudet College Press, Washington, D.C.

Program Guidelines for Children with Feeding Problems. Suzanne Evans Morris. Childcraft Education Corp. 20 Kilmer Rd. Edison, NJ 08817.

Small World. Merle Karnes American Guidance Service (AGS) Circle Pines, MN, 55014-1796. (800) 328-2560.

Report #2

C.A.: 8 years, 10 months

History: Has hydrocephalus and seizures. Birth position was breech and delivery by C-section. Birth weight was 11 pounds, 8 1/2 ounces. Head circumference was 52 cm. at birth and has changed very little since that time. First shunt surgery was age 2 weeks. He did take Dilantin in the past for seizure control. This precipitated gum problems and sensitivity. He now takes Tegretol and Phenobarbital. Reports gum condition to be much improved. The child still suffers frequent seizures. He currently attends the Multiple Handicapped unit. He receives physical therapy weekly, speech therapy daily and occupational therapy monthly.

He has feeding difficulties. He eats primarily soft foods, does not chew well.

Mother reports first words to have occurred at age 3 years and these were /dada/ and /gink/ for "drink". He has had a hearing evaluation in the past. He enjoys school, to be very responsive to his teachers, and to look at and touch pictures in a book with his speech therapist.

Evaluation: He was hesitant in the unfamiliar examination session with unfamiliar examiners. However, he did not cry and mother felt he "did better than" she would have expected in a new situation - even though he may not have performed to his full potential.

Sequenced Inventory of Communication Development (adapted in part for child's physical handicaps "scores", therefore, are approximations):

Receptive Communication Age	100% at	4 months
	80% at	8 months
	66% at	12 months
	60% at	16 months
	30% at	20 months
Expressive Communication Age	100% at	4 months
	100% at	8 months
	40% at	12 months

Vocalizations: characterized by the following sounds heard today or reported by mother: /go, w, m, b, g, k, w, ma, wowo/. Words reported included: /gink/ for drink; /dada/, /mama/. Child seemed to imitate more at around age 11 months, but less since that time. Mother reports that child is beginning to use more inflection of late.

Feeding: child does not clean spoon with lips. He could get some increased lip activity with oral control and slight pressure down on tongue during spoon feeding.

Tongue: is thickened in appearance; lacks good tongue bowl pattern; no tongue laterilization was noted.

Congestion: some was noted during feeding, child coughed a bit when positioned more in an upright way.

Tactile: Child appears hypersensitive orally

Feeding Suggestions:

1. Position head at midline with capital flexion/neck elongation (a chin tuck). Gradually bring chair to a more upright position for feeding. Note, however if child coughs, or is more congested in this position. Be careful to watch for this or fatigue and change chair position gradually over time. Present food/bottle at midline and from slightly below - not above child - to avoid head turning to the left and neck extention patterns.

2. Prepare child before feeding and periodically throughout the day with graded oral tactile stimulation. Consult OT or NDT trained SLP for details. Gradually, using firm slow pressure, from body toward head and face and mouth touch around cheeks, lips, on gums from midline to right or midline to left (do not rub across midline or gums). Rub using mother-care spoon down midline of tongue; rub inside cheeks slowly,. Touch on alveolar ridge and hard palate. Do only a small amount at a time. STOP when child refuses or shows he dislikes what you are doing. Return to a spot on his body or face which he was able to tolerate and begin to work forward again. Have rhythmical music available to help regulate your input. Consult OT or NDT trained SLP BEFORE beginning this program and periodically during the program.

Bottle: Keep head at midline in capital flexion/neck elongation. Gradually wean to a cup as oral/tactile toleration increases. Monitor liquid intake to be sure child receives enough liquids daily as you transfer to a cup.

Spoon: Use a Mother Care spoon. Place it into and out of mouth in a straight plane. Do not scrape food off on upper teeth. Give slight pressure down on tongue as spoon enters to elicit a tongue bowl and lip closure. Support jaw to get lip closure - see attached pictures at end of this report.

Cup: Begin with lips approximated and head in chin tuck. Lay cup on lower lip. Place a small amount of liquid in mouth. Hold lips closed until child swallows. See attached pictures.

Solid: Use meltable solids at first e.g. graham crackers. Place food on back side of teeth. Alternate sides of mouth for biting. Rub solid against lateral border (side) of tongue as food enters to encourage tongue laterization. Use oral control to help child chew solid and hold mouth approximated until swallow occurs. Purchase S.E. Morris book "Program Guidelines for Child with Feeding Problems", from Child Craft Corporation.

Tactile: terry cloth, child's hands, toothbrush etc. in favorite food and let child rub these textures in his mouth, or you assist him, to help decrease his oral sensitivity.

Recommendations:

1. Placement in special education classroom with services of teacher, speech pathologist, occupational and physical therapist experienced in service delivery to students exhibiting severe or multiple handicaps.

2. Possible reevaluation of hearing by a certified audiologist. Child did not localize to sound or voice today. If the classroom personnel can elicit localization in a more familiar setting, then audiological re-test may not be necessary. If localization skills are not present readily in the classroom to sound, music, familiar and unfamiliar voices and to his name, hearing and tympanometry re-testing might be indicated.

3. Monitor gum and dental status as needed, and monitor teeth gritting.

4. Specific areas of speech/language stimulation should include the following areas/focuses.

A. Positioning:

Position child toward symmetry and stability. Consult OT and/or PT as needed. Consider positions which maximize capital flexion/neck elongation and head/trunk stability, and which minimizes fatigue. If child is in chair consider using a slant board on his tray for materials so that he can maintain capital flexion/neck elongation and central vision (not a downward gaze always) to be able to see materials.

Cover the slant board (which can be made out of cardboard) with "Post It" board which holds objects and pictures without any additional adhesive or velcro, etc. A large sheet of this material can be purchased for a minimal amount at office supply stores, and looks like "cork board".

A second position might be supine with child's head on a pillow or with teacher/therapist feet under child's head to foster support and capital flexion/neck elongation. Present materials centrally and within child's easiest range of vision. Watch that no pressure is placed on the area of the shunt in the head. (Positioning for feeding is described in feeding section above.)

B. Auditory Skills:

1. Localization: Choose position 2 above. Use live voice, taped voice (parents), music, familiar/unfamiliar voices and child's name as stimuli. If child does not turn at least his eyes in direction of sound source, you can tilt him in direction of sound, using your feed and body. Give reinforcement when child focuses on sound source, e.g. kiss/hug; picture of mom/dad; etc.

2. Response to single words/simple commands. Use functional phrases or words that will be part of child's daily activities as goals. E.g. look, touch, cup, spoon, mom, dad, eat, sleep, diaper, chair, get up, go, comb, wash rag, etc. Select 1 phrase and 1-3 items to begin with. Use same phrases and activity over and over again everyday (e.g. "Time to change diaper", "Diaper"). Let child see, touch, smell, crinkle diaper. Go to same changing place each time. Show him diaper. Tell him "here we go to the (table, floor) to change diaper." Watch over time if child begins to look for: a) where diapers are kept, b) where he goes to be changed, or c) if he will select diaper (look at, or touch it) when given a two choice task ("Where's your diaper"? Show him the diaper and another item, so he can choose).

   Repeat for activities such as time to eat, sleep, bath; items such as clothes, favorite foods, toys; eating utensils, bathing objects; etc. Have a family repeat some goal activities at home for maximum carry-over.

3. Two choice activities: After stimulating and experiencing a few functional, daily used items for a few days/weeks, begin receptive language activities and choice making activities. E.g. IF shoes, shirt and hat have been presented, begin to give child 2 choice options during dressing. Hold up shoe - let him touch, see, etc. the item. Then shirt. Then hold both in his line of vision and ask him to "look at" or "get" shoe (or shirt). Later during snack activities, for example, let him choose what he wants in a 2 choice option (e.g. Drink vs. spoon of food - asking: "Do you want _____ or _____"). Be sure he's been exposed to the options first, knows what they are, and likes at least one of them enough to indicate communication for a desired item. Work on people identification also - pictures of mom/dad, for example.

C. Communication:

1. Proceed with development of choice options as described above.

2. Devise simple holders for 2 choice options to be placed on child's tray or on the floor if he is supported in sitting or sidelying. A simple commercial holder is included in this report, but it can be made very cheaply as well.

3. Teach tool use with simple homemade switches or commercially available switches and toys. Teach child that he activates music or toy when he touches a switch. Cover switches with various textures to help him differentiate switches. References for these are included in this report. Consider color coding switches also as mother reports child to attend to certain colors very well.

4. When child learns to activate toys or tapes recorded music, or mom/dad's voice on a tape by depressing a switch, begin to develop a simple electronic communication system for him as follows:

   a. Use 1-3 tape recorders.
   b. Use endless tape loops (tapes that repeat the same message over and over - can be purchased at Radio Shack for $4.98 a piece).
   c. Tape a phrase such as "hey come here" or "I want more". Teach a child that when he touches the switch and says each phrase (teach only one at a time), that he gets mom to come, or he gets more to eat, etc. Begin with only one phrase, then add another small tape recorder. Cover switches in different textures to help differentiate for child.

      or

   d. Consider using object boards described above so child can touch/point to his desired item. At first show him 1-3 objects. He then "gets" what ever he touches first and you say "Oh you asked for _____". Teach him that touching an object will be his way of requesting.

      or

   e. Use combination of all of the above plus any sign and vocalization child is able to use/learn.

D. Other Communicative Intents:

Greetings: Whenever appropriate physically assist child to wave in response to Hi/Bye. Encourage each teacher, aide therapist, etc. to greet child on a regular basis and assist him to respond.

Refusal: Honor (whenever possible) child's expression of rejection or refusal. Record the ways in which does so, then select one way e.g. pushing away undesired person or object, as his regularized/standard way of indicating NO. Tell him - "oh you're saying NO, NO, NO - show me so I'll know you're saying NO." Physically assist

him in pushing away the object/item, shaking head NO or whatever way has been agreed upon as his standard regularized way of saying NO. (Consider his "pouting" facial expression also.)

Gaining Attention: See above regarding endless tape that says "Hey, come here."

Request: See above regarding two choice options endless tape loops, object boards etc. Consider also his "smile" as a yes response when asked "Do you want _____".

E. General Language Stimulation:

Follow development goals but choose only the most functional words for Child e.g. - for body parts select hands (because he will be reaching); foot - child was more accurate using switches with his foot than hand at first, eyes because he will be working on "look", "look at X"; most used objects, clothing etc.

a. Work on "give", "get", "look".
b. Increase motor imitation skills.
c. Reinforce any vocalizations via mutual imitation, gaming activities.
d. Tool use.
e. Variation of schemes on objects, manipulation of objects by their characteristics, e.g. banging, shaking waving, etc. and functional use of objects motor imitations.

5. Request OT consult on sensory stimulation/normalization, especially for left side of body and for intra and extra - oral areas.

Report #3

C.A.: 12 years, 2 months

History: Child is diagnosed as having cerebral palsy. Child was 1 and 1/2 months premature. Child had extensive feeding problems in the past, but parents note this to be improved now. He has visual problems because eye lids do not completely pen.

Evaluation:

Sequenced Inventory of Communications Development: Receptive Communication Age: 8-12 months level with occasional scattered successes at 16, 20, 24 month levels. Severe motor limitations impair child's ability to respond somewhat.

Expressive Communication Age: Approximately 4 months level, but child does not have an augmentative communication system in place and his severe motor handicaps deflate his score on this test instrument.

Auditory Skills: Child arouses to sound and voice and localized to the right but not the left (head control?). He responds to a few single words, some phrases and uses a yes /no head response to some questions. Audiological evaluation would be appropriate.

Vocalizations: Were infrequent and limited by child's severe motor deficits. Those heard today included: /aga/; /aijaijai/; /mm/. See further notes regarding these skills under respiration/phonation section of this report.

Communication:

1. Speech Performance Acts: Probably illocutionary. Parents can easily interpret certain face, body and vocal output. Examiner understood some also today.

2. Communicative Intent:

Imperative/Demands: Uses voice or gesture to request.

Declaratives/Calling: Uses voice to gain parents or examiner's attention.

Request: Used /m/ for more when reinforced or spontaneously used /a/ for requesting.

Refusals: Ignores examiner; throws undesired items.

Expression of Emotion: Difficult to interpret.

Provides Information: Not noted.

Making Choices: Could select an item named out of two options on occasion, could find the switch which activated the music. This is a major area of need for him.

3. Type of Communicative Behaviors:

Initiation: Uses vocalizations to gain attention and gestures and vocalization to get "more music".

Imitation: Learned quickly to hit switch to activate music; used some mutual imitation of vocalizations.

*Response: When positioned well by PT so child could use his vision and his hands and arms, he responded to a few questions by a yes/no head movement and touched a few items as directed. He understood the names of two body parts (hand, foot); understood "No", "Don't bite", "don't throw"; responded to "get" and with aid "give"; found spoon, cup, and shoe.

4. Primary Modes of Communication:

Receptive: Child attends especially well to louder, musical input and liked light touch. Tactile input was especially helpful to him. He used his eyes when positioned in PT's lap and when she held his head steady with capital flexion/neck elongation.

Expressive: He learned to use /mm/ to request more; activated a switch with his hand. He already uses some gestures, facial movements and one or two vocalizations to attempt expressive output.

5. **Turntaking:** Child mutually imitates vocally. Motor imitation of immediately functional movements of arms and hands is a major goal for this child.

6. **Awareness and Engagement:** He was most likely to attend to music, a variety of tactile input, a musically intoned louder voice. He sometimes appears to not respond but may simply be ignoring stimuli. He really enjoyed tactile and social praise for good work and attended well when this was provided.

7. Cognitive:

Circular Reactions: Present. Increases with a variety of stimuli.

Object Permanence: Did reach for music switch after it had been removed. Increase this ability.

Schemes: A major area of need. He usually just throws items. Teach him to explore items by their characteristics, to hold and handle items etc., work on grasp/release of items into containers, etc.

Tool Use: Emerging with music switch activator

8. Oral Motor

Full Body Observations: Lack of good head control (lack of capital flexion/neck elongation); poor trunk control (child leans to right side) scapula winging; fixed pelvis in a posterior tilt with inactive abdominals and internal rotation of lower extremities; fixed in flexion at hips, knees and ankles; shoulder elevation; scapulo-humeral fixation; elongation of left upper trapesius and shortening of SCM on the left - uses SCM for head control-- not the capitial flexors.

Respiraton/Phonation: Reverse respiraton, clavicular breathing, "snorting" or velar sounds in breathing when in supine. If seated more upright with capital flexion/neck elongation and trunk elongation with stability, breathing is improved and vocalizations are more oral. There is a noisy insiration most of the time when neck is extended which appears to occur in conjunction with tongue retraction and elevation.

Oral-Motor/Feeding Patterns: Low toned oral/facial area; purse string in lips with one swallow per suck in cup drinking; lip retraction; sucks food off spoon - does not use active lip clearing from a spoon; poor jaw stability; holds head extended and to the right in feeding; tongue has poor tongue bowl response; bifid appearing tip; in general tongue and lips are quite slow in movement. Child has a high arched palate, poor dental condition, and malocclusion.

Remember: All recommendations are specific to this student. Do not assume they are useful to others unless full evaluation is done by a qualified examiner.

Suggestions to improve feeding skills include:

1. Position as upright as possible giving head support to keep head at midline (as much as possible) and capital flexion/neck elongation (consult PT). Give trunk support and elongation.

2. Work to improve capital flexion/neck elongation; respiration - by trunkal rotation and elongation; abdominal stimulation - consult PT or NDT trained SLP.

3. Improve oral/facial tone and lip and tongue activity. Provide cheek and lip tapping; stroke down midline of tongue with spoon to elicit tongue bowling; give small amounts of intra and extra oral tactile stimulation. STOP if child finds this aversive.

4. To decrease purse-string response in lips and lip retraction give finger vibration down face from below eyes to mouth using your fingers only. This should be demonstrated by a qualified therapist before use. This helps release the lip retraction. Parents were shown this technique today.

5. Obtain and use Mother Care Spoon for feeding. Place spoon in and out of mouth in a straight plane - do not rub off against upper teeth. Give slight pressure down on tongue as spoon enters mouth.

6. Obtain Suzanne Evans Morris' book Program Guidelines for Children with Feeding Problems and consult pages regarding spoon feeding, chewing, and cup drinking.

7. Consult a NDT oriented SLP or OT for further information and treatment suggestions.

RECOMMENDATIONS:

1. Placement in a public school program for students with severe handicaps with a teacher certified in severe/profound. Services of a certified SLP and licensed PT and OT (all of whom must be experienced in service delivery to students with severe and multiple handicaps) is also necessary.

2. Audiological evaluation by a certified audiologist with ENT consultation to determine if hearing is within normal limits, especially on the left side since child did not localize to that side. (if this has not been completed in the very recent past).

3. Regular dental evaluations.

4. Medical check of noisy breathing and "snort" or "snoring" sounds on inspiration.

5. Specific Speech/Language treatment should include the following:

A. Positioning materials is of primary importance. Provide for capital flexion/neck elongation. This allowed for maximum use of eyes and vision. Two ways of doing this were:

*Someone (PT if possible) holds in lap with good trunk and head positioning - actually holding child's head in good position for brief periods of time (*Consult PT for exact suggestions before using such a position). Teacher or therapist sits in front of child with academic or therapy materials positioned so that child can use his eyes to see it. Try to keep items up some so child does not use the constant "downward gaze" he has been using due to his head, neck and eye positions. If only one person is available, ask PT to teach each instructor how to position child's body. Sit facing a mirror so you can see when he is looking. Put materials on a slanted table or cardboard holder so that they are elevated some thus avoiding the downward gaze. Cover the

slanted surface with "Post-IT" board or velcro, which holds light weight items or pictures in place. Ask PT and OT how to help child reach and touch items.

*A second position for the child might be supine with his head on a pillow or your feet which provides the capital flexion/neck elongation. Keep head at midline as much as possible.

Holding items or pictures within child's line of vision - up a bit so as not to reinforce that constant downward gaze.

B. Sensory Input: Use musicality in your voice, consider melodic intonation techniques. Use music as a reinforcer. Use tactile and social reinforcement regularly. If he is to touch a picture or switch, consider making it easier for him by covering the switches with different textures or pasting different textures on the bottoms of large pictures to help him find them at first. He likes different textures to feel.

C. Improve Auditory Skills. Using the body positions suggested, work on sound localization. Turn on taped music, taped voice or a radio at ear level on either side of his head. Help him to turn and look and touch the sound source. Tape mom and dad's voice and use these as a stimuli. Teach turning to his name when called. If he does, reinforce with music or enthusiastic social reinforcement. You could also use a toy which lights up - as he enjoyed lights also.

D. Increase cognitive skills which aid improved language and communication skills.

1. Improve object permanence - searching for a desired item not directly in sight.

2. Increase the use of various schemes or actions with objects. He usually first throws objects he is given. Help him investigate them e.g. by their characteristics - feeling items with lots of different textures; banging, or shaking, or rattling different kinds of noisy items. Try to move him toward more functional use of simple items e.g. spoon to his mouth; cup to his mouth (be sure there is a bit of food or drink on these so there is functional reason to imitate the correct action with the object); comb to hair; washcloth to face or hands (this is a great tactile activity as well).

Encourage imitation of functional actions. A really fun one -- Make the "items in the container" switch described in L. Burkhardt's book listed in the references at the end of the Switch Interfaces module. In this switch you place a light touch switch which activates toys or a tape recorder in the bottom of a can. The child is to drop items into the can. The weight of the items activates the switch and the music or battery comes on! This way you are teaching imitation - dropping items into a container - but it results in a fun reinforcer for the child. Use this as a "clean-up" activity after lunch/snack and child helps put things away in the proper containers.

E. Increase Tool Use. Make several simple switches that activate battery operated toys or tape recorders. The easiest ones are the simple copper plates or the notebook switch (see Switch Interfaces module for instructions to make the notebook switch). He learned very quickly that if he pushed the switch, music can come on. That's tool use! Cover the switches with different materials so he has a choice - e.g. the fuzzy one makes music and the rough one turns on a flashlight (he liked both lights and music). Try a cassette switch too - it would be even easier for him to use. Also try a joy stick - you might already have one that plays games on a brightly lit screen. That would be great to capture his attention visually.

F. Now he is ready to use these skills to communicate. Obtain some "endless tape loops" from Radio Shack. They cost approximately $5.00 each. Get the ones with 10 second intervals. Tape a short phrase or word every three seconds - three times so that the tape is filled with that same phrase and will play that phrase every time you activate it with your simple homemade switch or commercially available LT (light touch) switch.

Select one phrase, e.g. "I want to eat", or "I want to drink", or "I want up". During a very repetitive task like eating snack or lunch, teach him to hit the switch. Whenever he does, he gets a bite or drink. Help him regularly at first. Then gradually see if he will "ask" by himself. (Be sure to cover the switch with a brightly colored, distinctive textures so when he uses more than one switch later, he knows what it will say.)

Another good activity is "calling". Make a tape that says "hey come here!" or "Come here _____ " (good for home). One teacher or therapist helps him turn on the switch and another comes and hugs or talks to him etc. when he "calls".

Now when he has mastered these ideas, place two switches in front of him. Use brightly colored, different textured materials on each one, e.g. one for eat and one for drink. Now he is allowed to make choices! Be sure to give him exactly what he asked for, even if it was only accidental, so he learns to be careful of what he "says".

This technique can be varied to request music, lights, favorite toys, a diaper change (e.g. whenever you're going to change him - have a tape that says "change my diaper please" available).

Make the tapes using a child's voice of the same age as he. Show mom and dad how to make and use these simple switches at home. A contact person for simple courses in making these switches is in the reference section.

G. Other Communication Strategies

1. More: Child can make an /m/ sound. Encourage this as a request for more. Find activities and games he especially loves or foods. Play for a few seconds, stop, say /m - ore/ in his ear. After a while begin to wait for him to say /^/ to request more.

2. Asking questions for a yes/no response. On some simple vocabulary tasks, we were able to ask him - Is this a _____? and he clearly nodded yes or shook his head no. This is a great way to ask what he wants - Do you want _____? yes or no. It is also a great way to teach vocabulary or language concepts. Choose two items, e.g. cup and spoon or ball and truck. Play with them at length. Use them. Label them over and over. After a few days, see if he knows them by asking, "Is this a _____?" (yes or no). Be sure his head is positioned well and he can see the item.

3. Use a prelanguage curriculum guide for the multihandicapped (see references).

H. Response to Directions: work on child's responding to touch (use light touch switches at first so whenever he touches as directed, he gets music etc.); give, get, hold, and look. Do during daily natural activities which occur regularly throughout a day.

I. Use the positions described earlier to be sure he can see well. After he finds items as described above in Step G, couple the picture with the item, e.g. pick a favorite toy or food he knows. Put a picture right in front of it. Have him look at and touch the picture and then he gets his food or toy right away. Teach just a few at a time. This is also a good communication system - a picture board! When he learns a few pictures, mount them in sets of two and let him touch the one he wants. At first he gets whatever he touches, even if its an accident so he learns he "gets what he asks for ". Use large, brightly colored pictures.

J. Increase vocalizations:

1. Use mutual imitation techniques described in Intervention Strategies module.

2. Reinforce vocalizations as if meaningful. Record what he says and when. Can you figure out what they might mean? Ask parents to help so you can reinforce vocalization and make it occur more often.

K. Improve oral-motor, feeding and respiration. See oral-motor section of this report and consult PT or NDT trained SLP regarding respiration.

Report #4

C.A: 5 years, 5 months

Background: Difficult birth, hypotonic at birth, janudice, athetoid C.P., allergies, seizures, colds, ear problems.

Attends community-based day care with intervention at that facility.

Sequenced Inventory of Communication Development:

Receptive Communication Age: 12 months with 75% success at 16 month level, and slight scatter at 20 months.

Expressive Communicative Age: 8 months

Areas of Deficit: Lacks response to single words (developmental vocabulary) and simple directions, (get/give/put); finding body parts; where's _____; hi/bye; one/all/many; opposites (e.g. big/little) etc.

Auditory Skills: Localized, but more slowly on the left, than right side.

COMMUNICATION:

Speech/Performative Acts: Illocutionary-uses interpertable non-standard gestures - no formal communication system is in place as yet.

Communicative Intents: Has many in evidence, including:

Imperatives (demands): more-gives cup back to mom; reaches or points to desired items.

Declaratives (calling, sharing information): cries or laughs loud to gain attention, sits very straight, looks proudly at mom to share an accomplishment; shows object to "listener" in order to share and initiate communication.

Refusals: Shakes head no; covers head; turns away; refuses to open mouth to eat.

Expression of Emotion: Laugh/cries appropriately to situations.

Avoidance: looks away, hugs, etc.

Makes Choices: Easily learned to use index finger to point to picture of graham cracker vs. water in a structured 2 choice selection. (Total time to teach task - 7 minutes).

Affirmation: Smiles to affirm e.g. "Do you want _____?" Smiles for yes.

Type of Communication Behavior:

Initiation: Present: to gain attention, share information, request.

Response: Limited due to vocabulary deficit - Responds to visual stimuli, gestures best.

Imitation: Limited as yet.

Primary Mode of Communication:

Receptive: Responds best to musicality, visual stimuli, gesture, situationally based or heavily contextual stimuli.

Expressive: Vocalizes vowels; gestures; facial expression; body movements.

Sensory: Visually attends to gestures, pictures (when used contectually e.g. to request for food); Could respond to both color and simple line drawing in context.

Auditory: Loves music especially, and responds best to "animated" speech.

Tactile: Was defensive in the past, did not like light touch - see OT report.

Movement: Stimulates vocalizations but is sensitive to movement - see OT/PT reports.

Other: He responds well to electronic items.

Turn Taking: Mutually imitates vocally and motorically but does not spontaneously imitate a great deal.

Cognitive/Sensory-Motor:

Responds to a variety of stimuli.
Localizes.
Tracks.
Focuses on speakers and stimuli.
Has circular reactions.

Cognitive/Sensory-Motor (con't):

Has object permanence.
Has tool use for several activities.
Has some schemes e.g. holds, mouth, pats etc.
Manipulation by characteristic - has some - good areas to expand.
Functional use of objects - has some - good area to expand.
Imitation - limited
Match sort - areas of need.

Vocalizations: Are limited due to cerebral palsy (dysarthria), poor respiratory patterns for speech and motor planning difficulties. Child uses unrounded vowels (a,); bilabials /m, b/; and reportedly is beginning to match mother's inflection e.g. /m,m,m/ (short, short, long) on direct imitation.

Oral Motor/Feeding:

Full Body: Postural instability with fixing over basically low tone.

Pathology/Missing Components: Good head control but uses neck extension in eating; fair weight bearing, difficulty in weight shifting, lack of controlled lateral flexion/rotation; internal rotation of upper extremities, scapula instability (winging, scapula - humera fixation); inactive abdominals, lower extremities are "frog leg" positioned often (abducted and externally rotated).

Oral: Low tone face with inactivity. Mild suckle and at times tongue thrust; decreased lip and cheek activity, jaw instability - difficulty maintaining posture overtime (begins drink with lip closure and good jaw position but cannot maintain); can sequence swallows from a cup; bites and chews but prefers chewing on left side and does not lateralize tongue to right; lacks good tongue bowl response, neck hyperextension in drinking, drooling, especially during motor activities.

RECOMMENDATIONS:

I. Continued OT, PT, SLP, and educational interventions.
II. Continued audiological and otological monitoring.
III. Specific Speech/language programming should include:

A. **Development of an Augmentative Communication System:** (see section F in this report)

This is most pressing need currently. While further language/cognitive work will be useful, he has enough prerequisite skills to begin a simple system to express his communicative intents in a standardized (locutionary level) manner; now. Consider the following:

NOTE: Positioning is of utmost importance to his attending abilities. He did much better in language, cognitive or communication tasks if he was seated in a supportive position in a teachers lap facing the therapist. If this is not possible, consider using a volunteer to support child, or place him supine, his head on a pillow or your feet with head in capital flexion/neck elongation position. Perhaps bend legs with feet on floor, your legs around him which gives him a feeling of being surrounded and knowing his boundaries. This position allows him complete support and stability so he does not have to worry about his body (balance etc.), gives him eye to eye contact etc. Consider also a bean bag chair for some programs (child sitting into chair and fully supported) so he only has to worry about attending to the task at hand. Consult PT first. Remember these positions are only for intense language/communication/cognitive tasks when we want him to be able to concentrate solely on the task at hand and not worry about body stability, balance, equipment, etc. which makes it difficult for him to attend to tasks.

B. Improve Language and Cognitive Skills:

1. Auditory Skills:

   a. Interpretation of environmental sound: Emphasize sound and listening in daily activities. e.g. before bath time: Take him with you to turn on the water. Listen to water sound. Hide your eyes and listen. Talk about water - use 1-2 word descriptions - over and over. After a while, (a few weeks?) tell him "it's bath time. I hear the water" before you go to see it. Next, in a few weeks have the water running. Go to the door with him and listen. Does he react as if he knows it is bath time?

   Finally, have water running (door open). From a distance listen to the water. Does he react as if he knows etc. bath time? Other examples include phone ringing (take him with you, listen, let him pick it up and listen etc.); fixing dinner, knock on the door (play this with his brother, granny etc. Someone knocks on door, he opens it, and gets a big hug or kiss. Does he eventually understand the knock means someone is there?)

   b. Response to single words/simple directions. Selection of goals can be done in two ways: developmentally or functionally.

Developmentally: See handouts at the end of Intervention Strategies Module for sequencing of vocabulary development. Use melodic intonation and begin with finding body parts. Select two, use high pitch for one (e.g. hair) and low pitch for the other (e.g. foot).

Functionally (preferred at this age and for this child): Select 4-5 simple directions and words to begin with. Decide how you wish to give directions (simple repetitive input, using melodic intonation, physical prompts or cues or gestures.):

"Change diaper"
"Time to eat"

"Let's take a bath"
"Give me _____ "(give being the target)
"Get it"

Try to find times in the day when these activities occur naturally. e.g. every time you're going to diaper, pick the same location. Have a diaper nearby. Show the position he is to assume (e.g. lying own). Say the same phrase. "It's time to change your diaper - lets change diaper." Assist him to the "changing spot." Tell him, "get diaper" and finally "lay down". Use melodic intonation or make up a very brief diaper changing song which includes these 3 phrases on a repetitive basis. Watch to see if he begins to respond as you fade assistance or gestures. Consider signing key words: diaper, lay down.

Use total communication or put these on this communication board. Eventually he can "request" diaper changes e.g. "Oh___ , it's time to change your diaper." See if he responds or goes to "changing spot". "Good, you're ready. What do you want?" He touches picture from diaper box, which you have placed on his communication board.

Give/Get: Use gestures and pointing to help him understand these. Pick only one until he understands. In play use repetitious items or activities, e.g. blocks put in bucket. He is allowed to play for awhile. Then you ask him to "give", you hold out hand. Physically assist him at first and go through all 5-10 blocks. When you get the block, put it in a can which has a switch to activate music (tape recorder, radio). When he has given you enough blocks, the music will start.

Use "give" and "get" in dressing, eating, and washing activities, etc. When he learns it, begin to label the items he is getting (e.g. clothes, foods, etc.) Now he is ready to begin the developmental vocabulary activities. These naturally spring from the functional work.

Show him two items of clothing (after you have spent a few weeks naming them over and over playing with them, letting him help put them on). Ask him to "get shoe" or "give me shoe."

Direct vocabulary work: springs from above sequence. Go in a functional/ developmental order. Always provide several weeks of experience with real objects (not pictures) or activities first. Then give child choice of options, then 2 choice options to give/get _____.

C. Increase Cognitive Skills:

1. Give extensive experience with tool use; e.g. whistle switch for TV (be sure to have a mini board on which he saw you draw of the TV). He must request before getting to turn on TV or stereo. Make or purchase and use simple light touch switches as attached to activate toys.

2. Improve simple motor imitation abilities e.g. clapping, items in a container (use the coffee can switch to encourage this.), stand/sit (use switches which activate music etc. to encourage this). You sit - he imitates (these are note book switches on chairs - when he sits he activates the music etc.). He could stand and sit in the bolster chair because it has supportive sides and a lap tray. Try this activity with such equipment.

3. Increase manipulation of objects by their sensory characteristics - e.g. banging, crumpling, ringing, shaking, feeling, listening to etc. sensory laden toys (to replace mouthing).

4. Functional use of items - increase those related to activities of daily living. Present _____, see if he can "show me what you do with _____ _____" e.g. eating utensils, clothes, toys, noisemaker, pencil/crayon, ball, toothbrush, bed, sink, etc. Use real items, not miniatures or pictures yet. Say and sign the appropriate verbs as he learns the function. This will help in receptive goals of vocabulary development and direction following later.

5. Match/sort

6. Consider use of the Van Dijk's communication program.

7. Check into the use of a "whistle switch" from Radio Shack to turn on TV, radio, etc. (Tool Use).

8. Make a "slide show" about him and his family. Teach him to use the remote switch to change slides (Tool Use). See Switch Interfaces module for information on making or purchasing remote for slide projector.

9. Look into software becoming available for use with severely handicapped programs from Apple II and other computer systems.

D. Increase Vocalizations:

1. Improve respiratory patterns: work toward active abdominals, thoracic respiration, weight shifting over scapula and pelvis, scapula stability, lateral flexion/rotation patterns, trunk elongation/rotation activities, balance and equilibrium responses. Perform in conjunction with OT and PT sessions to learn to stimulate above target goals.

2. Increase type and quality of phonation during above activities listen for prolonged vowels, variation in pitch, loudness, intonation. Use abdominal tapping/hand vibration to stimulate prologed vocalizations. Use mutual imitation at first (see definition). When changes occur during OT and PT

sessions, gradually shape changes in your vocalization to follow developmental patterns of vocalization: vowel prolongation, oral (nonnasal) vowels; short repetition of vowels, inflections changes on prolonged vowels.

3. Vary articulatory postures over improved vocal/phonatory output. After the two above steps occur and when child tolerates oral handling well during feeding the following suggestions will flow naturally.

   During OT/PT sessions when child is active, or with child in supine with his head on pillow or on your feet giving him capital flexion/neck elongation (chin tuck), his legs flexed, feet on floor, encourage him to vocalize (sing and see if he joins in, tickle a bit etc.) When he produces vowels, you can use some abdominal tapping (NDT consult needed) to prolong vowels. Now, using oral handling, close lips to obtain bilabials (Use lip tapping, cheek tapping - NDT consult needed); use tongue bowl activities and indirect tongue tapping to elicit alveolar phonemes (NDT consult needed).

   Consult OT to determine if child is ready to tolerate such oral-tactile stimuli.

   Use mutual imitation activities to increase quantity of vocalizations, and later to move toward spontaneous or direct imitation. Vary inflections and see if child follows.

E. Improve oral-motor/feeding skills.

Positioning: Consult PT for positions for maximum stability, capital flexion/neck elongation; trunk elongation; stable positioning of lower extremities (weight bearing at times?).

Preparation (and "nonfeeding" activities during the day). Consult OT first to determine if child is ready for these oral-tactile activities.

Tactile: Use cheek and lip tapping - slow firm pressure around lips, cheeks, - look for increase in facial activity.

Tongue: Slow firm pressure from tip to back to elicit tongue bowl response or "walk back" tongue.

Tongue Lateralization: Stroke side of tongue and see if tongue goes to that side of mouth.

Feeding: See Program Guidelines for Children with Feeding Problems.

Spoon: Present spoon at midline, place spoon in and out of mouth in a straight plane. Give slight pressure down on tongue as it enters mouth to elicit a tongue bowl response.

Cup: Place cup on lower lip with lips almost approximated. Place thumb or hand under chin giving only a base of stability for jaw to move on and off, since main problem is for child to maintain postures over time on his own, not passively being held in one place. Move from contact on jaw to slight pressure in at chest to maintain chin tuck and thus reinforce jaw stability.

Bite/Chew: Present food to be bitten on side back teeth. Give tactile stimulation to lateral border of tongue as it enters mouth to elicit tongue lateralization, especially to the right. Alternate sides of mouth for food presentation.

Consider resistance exercises with this child for improved jaw control, e.g. using beef jerky have child hold it in his back side teeth and resist your pulling on it. DO NOT LET child bite through it as he may not be able to manage chewing that substance.

Drooling: Use position e.g. child supine head on pillow or your feet with capital flexion/neck elongation. Do programs etc. in this position. This position gives the child much practice in using a more normal swallow pattern and feeling less saliva in his mouth. When OT feels child can handle the tactile input, perform Oral Treatment program in this position. Consult NDT oriented SLP for details.

Other Activities: While this child certainly has adequate head control in general he loses a good chin tuck (capital flexion/neck elongation) during feeding or speech attempts. Consult PT for activities within small controlled ranges (lateral head/neck activities; head control during trunk rotation and lateral flexion activities) to continue to improve head control which will in turn improve jaw stability and controlled movements. Consult NDT oriented speech pathologist for further explanation if needed.

F. Development of an Augmentative Communication System.

1. Development of 2 choice mini-boards for use during feeding, play, activity selection, etc.

    a. Select feeding time activities first. Have a favorite food and drink. Show child both real items and ask him "what do you want." Let child select.

    b. Repeat but have child point to desired item.

    c. Now show child the favorite food coming out of its package. Hold food right in box with picture of food. Ask child "What do you want, tell me" he must now touch box to request the food.

    d. As above but have child watch you cut picture of desired food off the box. Proceed as above having child touch picture of food to request.

e. As above but keep real food item out of sight; child touches picture of food to request it in response to your direction "What do you want, tell me."

f. Now, for the drink option (which more than likely does not have a usable packaging picture), have child watch as you make a simple line drawing of the cup/glass he is using. Proceed through steps d and e above to learn to request a drink via a picture.

g. Now, present both picture options (food vs drink) from which child will choose desired item. Be sure to have the real items somewhere within reaching distance. Watch as child "goes for" one of the real items. This assures you of which item he really wants. Stop him and say "Oh, you need to ask" (just as you might encourage any young child who is beginning to use language/communication skills).

APPENDIX E

SOURCES FOR EQUIPMENT

AND

MATERIALS

COMPANIES AND MANUFACTURERS

AARO Medical Services
1010 Laurens
Greenville, SC 29607
(800) 845-3923

ABLENET (switches, control unit, slide projector adapter, Poly-lock)
1081 10th Ave. S.E.
Minneapolis, MN 55413
(800) 322-0956 or (612) 379-9143

ACTT
27 Horrabin Hall
W. Illinois University
Macomb, IL 61455
(309) 298-1014

ADAMLAB
33500 Van Born Rd.
Wayne, MI 48184
(313) 467-1415

AT&T National Special Needs Center
2001 Route 46
Parsippany, NJ 07054
(800) 233-1222
(800) 833-3232 TDD/TTY

AbleTech Connection
P. O. Box 292301
Kettering, OH 45429
(513) 299-9979

Academic Software, Inc. (Assistive Device Locator System)
331 W. 2nd Street
Lexington, KY 40507
(606) 233-2332

Academic Therapy Publications
20 Commercial Blvd.
Novato, CA 94947

Access Unlimited-SPEECH Enterprises
9030 Katy Freeway, Ste. 414
Houston, TX 77024
(713) 461-0006

AccessAbility
1120 Hicks Blvd.
Fairfield, OH 45014
(513) 829-5506

Adaptive Communication Systems Incorporated
P. O. Box 12440
Pitsburgh, PA 15231
(412) 264-2288

Adaptive Peripherals
4529 Bagley Avenue N.
Seattle, WA 98103
(206) 633-2610

Adaptive Technology, Inc.
5334 72nd Circle N.
Brooklyn Center, MN 55429
(612) 560-0861

Ali-Med (velcro)
297 High Street
Dedham, MA 02026
(617) 329-2900

Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010

Assembly Corner
R. R. 1, Box 9463
Waterbury Center, VT 05677

Automated Functions, Inc.
6424 N. 28th St.
Arlington, VA 22207
(703) 536-7741

Avos, Inc.
5230 Girard Avenue North
Minneapolis, MN 55430
(612) 521-0008

Linda Burkhart (books on making switches)
8503 Rhode Island Ave.
College Park, MD 20740

Canon U.S.A., Inc.
One Canon Plaza
Lake Success, NY 11042-9979
(516) 488-6700

Communication Skill Builders/Therapy Skill Builders
P. O. Box 42050-B
Tucson, AZ 85733
(602) 323-7500

Communications Research Corporation
1720 130th Avenue N.E.
Bellevue, WA 98005
(206) 747-2100

Computability
40000 Grand River Ave.
Novi, MI 48050
(313) 477-6720

Computer Aids Corporation
124 W. Washington, Lower Arcade
Ft. Wayne, IN 46802
(219) 422-2424

Computer Conversations
6297 Worthington Rd. S.W.
Alexandria, OH 43001
(614) 924-2885

Computers to Help People, Inc.
1221 W. Johnson St.
Madison, WI 53715
(608) 257-5917

Computervoice Corp.
P. O. Box 352
Newton Highlands, MA 02161
(617) 244-4233

Crestwood Company
Box 04606
Milwaukee, WI 53204-0606
(414) 461-9876

Digital Equipment, Inc.
146 Main St.
Maynard, MA 01754-2571
(800) 344-4825
(617) 493-talk (demonstration voices)

Don Johnston Developmental Equipment
P. O. Box 639
Wauconda, IL 60084
(800) 999-4660
(708) 526-2682

Du-It Control Systems Group, Inc.
8765 Township Road 513
Shreve, OH 44676
(216) 567-2906

FoxyVox Corporation
750 Eucalyptus Woods Rd.
San Marcos, CA 92069
(619) 744-8190

Garid, Inc.
9817 Valley View Road
Eden Prairie, MN 55344
(612) 941-5464

Handicapped Children's Technology Service
P. O. Box 7
Foster, RI 02825
(401) 861-3444

Imaginart Communication Products
25680 Oakwood Street
Idyllwild, CA 92349
(714) 659-5905

Interstate Voice Products
1849 W. Sequoia
Orange, CA 92668
(714) 937-9010

Kaye Products, Inc.
1010 E. Pettigrew Street
Durham, NC 27701-429
(919) 683-1051

Key Technologies
P. O. Box 1997
Morgantown, NC 28655
(704) 433-5302

Key Tronic Corporation
P. O. Box 14687
Spokane, WA 99214
(509) 928-8000

Kurzweil Applied Intelligence
411 Waverley Oaks Rd.
Waltham, MA 02154
(617) 893-5151

Laureate Learning Systems
110 E. Spring Street
Winooski, VT 05404
(802) 655-4755

MCP Industries (ethafoam for custom switch mounts)
P. O. Box 1166
Decatur, AL 35602
(205) 353-4133

Mayer-Johnson Co. (communication symbols)
P. O. Box AD
Solanda Beach, CA 92075-0838

Microcomputer Systems for the Handicapped
10418 Armstrong St.
Fairfax, VA 22030
(703) 352-3611

Oakland Schools
Communication Enhancement Center
2100 Pontiac Lake Road
Pontiac, MI 48054

Otto Bock (head rests & chest panels for wheelchairs)
4130 Hwy. 55
Minneapolis, MN 55422
(612) 521-3634

Peripheral Technologies, Inc.
1109 Hillcrest Rd.
Narberth, PA 19072
(215) 667-2190

Phonic Ear, Inc.
250 Camino Alto
Mill Valley, CA 94941
(415) 383-4000

Prentke Romich Company
1022 Heyl Road
Wooster, OH 44691
(800) 848-8008 or (216) 262-1984

J.A. Preston Corporation (postioning equipment)
60 Page Road
Clifton, NJ 07012
1-(800) 631-7277

Radio Shack Education Division
1600 Tandy Center
Fort Worth, TX 76102
(817) 390-3062

Rescue Speech Systems
5937 Portland Ave. South
Minneapolis, MN 55417
(612) 866-1661

Rifton (positioning equipment, hand held pommels)
Route 213
Rifton, NY 12471
(914) 658-3141

Fred Sammons (Dycem and assistive devices for self-care)
Box 32
Brookfield, IL 60513-0032
1-(800) 323-5547

Sensory Aids Corporation
Suite 110
White Pines Office Centre
205 W. Grand Avenue
Bensenville, IL 60106
(312) 766-3935

Sentient Systems Technology, Inc.
5001 Baum Blvd.
Pittsburg, PA 15213
(412) 682-0144

Shea Products, Inc.
2355 Avon Industrial Drive
Auburn Hills, MI 48057
(313) 656-2281

Southern Micro Systems
P. O. Box 2097
Burlington, NC 27216-2097
(919) 226-7610

SpeechMaster
64 E. 6400 S., # 235
Salt Lake City, UT 84107
(801) 266-3356

Street Electronics Corporation
Special Needs Division
1140 Mark Avenue
Carpinteria, CA 93013
(805) 684-6621

Syntha-Voice Computer, Inc.
1037 A Levick St.
Philadelphia, PA 19111
(215) 288-6662

TASH, Inc. (Technical Aids and Systems for the Handicapped)
70 Gibson Drive Unit 1
Markham, Ontario Canada L3R 2Z3
(416) 475-2212

Tecmar, Incorporated
6225 Cochran Road
Solon, OH 44139-3377
(216) 349-0600

Telesensory Systems, Inc.
P. O. Box 7455
Mountain View, CA 94043
(415) 960-0920

Texas Instruments
P. O. Box 53
Lubbock, TX 79408
(806) 747-3737
(800) 842-2737

Toys for Special Children
385 Warburton Avenue
Hastings-on-Hudson, NY 10706
(914) 478-0960

Unicorn Engineering
6201 Harwood Avenue
Oakland, CA 94618
(415) 528-0670

Voice Connection
17835 Skypark Circle, # C
Irvine, CA 92714
(714) 261-2366

VOTRAX, Inc.
1394 Rankin
Troy, MI 48083
(313) 588-2050

Wayne Co. Intermediate School District
Data Processing/ADAMLAB
3350 Van Born Rd.
Wayne, MI 48184
(313) 467-1415

WORDS+, Inc.
1125 Stewart Court, Suite D
Sunnyvale, CA 94086
(408) 730-9588

Zygo Industries, Inc.
P. O. Box 1008
Portland, OR 97207
(503) 297-1724

APPENDIX F

RELATED AGENCIES AND RESOURCES

RELATED AGENCIES AND RESOURCES

ACCESS
(Augmentative Communication and Controls Evaluation Services)
Gillette Children's Hospital
200 East University Avenue
St. Paul, MN 55101
(612) 291-2848

American Printing House for the Blind
P. O. Box 6085
Louisville, KY 40206
(502) 895-2405

Apple Computer, Inc.
Office of Special Education
20525 Mariani Ave.
MS 36-M
Cupertino, CA 95014
(408) 996-1010

Augmentative Communcation Services
350 Rumsey Rd.
Toronto, ON Canada M4G 1R8
(416) 425-6220

Augmentative Communications Lab
St. Elizabeth Medical Center
Empress Hall, Classroom 1-B
Dayton, OH 45408

Augmentative Communications Task Force
1966 Inwood Rd.
University of Texas
Dallas, TX 75225

Blissymbolics Communication Institute
24 Ferrand Dr.
Willowdale, ON Canada M3C 3N2

COPH-2 (Committee on Personal Computers and the Handicapped)
2030 Irving Park Road
Chicago, IL 60618
(312) 477-1813

Center for Special Education Technology
c/o Council for Exceptional Children
1920 Association Drive
Reston, VA 22091
(800) 345-TECH

Closing the Gap
P. O. Box 68
Henderson, MN 56044
(612) 248-3294

Communication Assistance Resource Service
3201 N. Marshall Rd.
Dayton, OH 45429

Communication Resource Center - Courage Center
3915 Golden Valley Road
Golden Valley, MN 55422
(612) 588-0811

Communication System Evaluation Center
434 N. Tampa Ave.
Orlando, FL 32802

IBM National Support Center for Persons with Disabilities
P. O. Box 2150 (A06S1)
Atlanta, GA 30055

NACE Center (Non-verbal Augmentative Communication Evaluation Center)
Speech, Language and Hearing Department
Crippled Children's Hospital and School
2501 West 26th Street
Sioux Falls, SD 57105
(605) 336-1840

NARIC/ABLEDATA
The Catholic Univ. of America
4407 8th St., NE
Washington, DC 20017
(202) 635-5826

Services: National Rehabilitation Center operates ABLEDATA, a computerized listing of info on rehab products

Non-Oral Communication Services
443-7 Greenridge
Dally City, CA 94014

Pennsylvania Assistive Device Center
150 South Progress Avenue
Harrisburg, PA 17109
(717) 657-5840 (in PA 800 - 222-7372)

Rocky Mountain Regional Center for Augmentative Communication
311 Mapleton
Boulder, CO 80302

Schneier Communication Unit
Cerebral Palsy Center
1603 Court St.
Syracuse, NY 13208

Thames Valley Children's Centre, Augmentative Communication Service
385 Hill St.
London, ON Canada N6B 1E4

TRACE Research and Development Center on
Communication Control and Computer Assess
University of Wisconsin
Waisman Center
1500 Highland Avenue
Madison, WI 53705
(608) 262-6966 or 263-5697

In Kentucky

Kentucky Assistive Technology Service (KATS) Network
Kentucky Department for the Blind
427 Versailles Road
Frankfort, KY 40601
(502) 564-4659
(States who are funded for assistive technology as of 9/90 include Kentucky, Alaska, Indiana, Iowa, Massachusetts, Mississippi, Nevada, New Mexico, North Carolina, Oregon, Tennessee, Vermont, Virginia, and Wisconsin.)

Disabled Citizens Computer Center (Western KATS Center)
Louisville Free Public Library
4th and York
Lousiville, KY 40203
(502) 561-8637

Blue Grass Technology Center for People with Disabilities (Eastern KATS Center)
898 Georgetown Street
Lexington, KY 40505
(606) 233-1483

KATS Research and Development Center
Department of Special Education
229 Taylor Education Building
Lexington, KY 40506-0001
(606) 257-4713

SpeciaLink
36 W. 5th St.
Covington, KY 41011
(606) 491-2464

University of Kentucky Assistive Technology Lab
Department of Special Education
229 Taylor Education Building
Lexington, KY 40506-0001
(606) 257-6278

APPENDIX G

PROFESSIONAL ORGANIZATIONS

PROFESSIONAL ORGANIZATIONS

American Speech-Language-Hearing Association
10801 Rockville Pike
Rockville, MD 20852
(301) 897-5700

Publications: Newsletter, Journal of Speech and Hearing Disorders, Journal of Speech and Hearing Research.

Council for Exceptional Children (CEC)
1920 Association Drive
Reston, VA 22091
(703) 620-3660

Publications: Each division has a newsletter and journal. The divisions related to communication programming for students with severe and multiple handicaps include:

Division on Physically Handicapped (DPH)
Division on Mental Retardation (DMR)
Division for Children with Communication Disorders (DCCD)
Division for Early Childhood (DEC)
Technology and Media Division (TAM)

ISSAAC-International Society for Augmentative & Alternative Communication
P. O. Box 1762
Station R
Toronto, ON Canada M4G 4A3

Publications: Augmentative & Alternative Communication Journal and "Communication Outlook" (newsletter)

The Association for Persons with Severe Handicaps (TASH)
7010 Roosevelt Way NE
Seattle, WA 98115
(206) 523-8446

Publications: Newsletter, The Journal of the Association for Persons with Severe Handicaps (JASH)

APPENDIX H

STATE DOCUMENTS

&

RELATED TRAINING PROJECTS

STATE DOCUMENTS AND RELATED TRAINING PROJECTS

These documents are available by contacting the Kentucky Department of Education, Office of Education for Exceptional Children; 8th Floor, Capital Plaza Tower; Frankfort, KY 40601; (502) 564-4970.

Guidelines for utilization of teacher's aides in speech and language programs (1988)

Kentucky severity rating scale for speech-language (1988)

Service delivery models for speech and language programs serving children and youth ages three to twenty-one (1988)

Primary level support document: Kentucky program of studies for students with moderate and severe handicaps (contact Preston Lewis, Assistant Division Director)

Secondary level support document: Kentucky program of studies for students with moderate and severe handicaps (contact Preston Lewis, Assistant Division Director)

Support document: Kentucky programs for students with severe handicaps including deaf-blindness (all levels). Prepared by the Kentucky Deaf-Blind Intervention Program. (contact Preston Lewis, Assistant Division Director or the Kentucky Deaf-Blind Intervention Project)

These documents are available by contacting the **Kentucky Systems Change Project;** University of Kentucky, Interdisciplinary Human Development Institute; 114 Mineral Industires Building, Lexington, KY 40506-0051; (606) 257-1714.

Hudson, M. (1990). Selecting IEP activities for students with severe handicaps. Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky.

Hudson, M.E., & Leatherby, J.L. (1990). Writing IEP goals and objectives for students requiring basic skill instruction. Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky.

Kleinert, H., & Hudson, M. (Eds.) (1989). Model local catalogs and curriculum process for students with moderate and severe handicaps. Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky. (also IEP Printer Program for Apple IIe and IIgs or IBM)

Kleinert, H., Smith, P. D., & Hudson, M. (1990). Quality program indicators for students with moderate and severe handicaps. Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky.

Smith, P. D. (1990). Integrating related services into programs for students with severe and multiple handicaps. Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky.

Smith, P. D., & Leatherby, J. L. (in press). Services for children with special health care needs: Guidelines for local school districts. Frankfort: Kentucky Department of Education, Office of Education for Exceptional Children.

Smith, P. D., & Kleinert, J.O. (Eds.) (1990). Communication programming for students with severe and multiple handicaps (rev. ed.). Lexington: Kentucky Systems Change Project, Interdisciplinary Human Development Institute, University of Kentucky.

SPLASH: Strategies for Programming Longitudinally for All Severely Handicapped

SPLASH is a comprehensive training project primarily designed for teachers of students with moderate to severe handicaps (e.g. TMH, S/PH, multi-handicapped). It is a collaborative effort between the Office of Education for Exceptional Children and the University of Kentucky. The content focuses on developing and implementing non-diploma/certificate programs with and emphasis on community-referenced instruction. Training is provided once each year for 30 participants.

The 10 days of training consists of three modules spread out over three months in the Fall. Module I includes integration strategies, implementing functional curriculum and systematic instruction. Module II covers community - based instruction including assessment strategies, adaptations and administrative issues. Module III focuses on integrated therapy and embedding basic skills (communication, motor, etc.) and vocational/transition.

The training sessions are followed by a semester of implementation, on-site technical assistance and a one-day follow-up session. Three hours of graduate credit level are available for persons who complete the training. An administrator training session is also part of SPLASH training. Funds are available for participant expenses as well as stipends for participants to purchase functional instructional materials. Some funds are also available to districts for release time for participants. Districts who are interested in being a host site or sending teachers and other school personnel should contact the Project Coordinator, Preston Lewis at Kentucky Department of Education, Office of Education for Exceptional Children; 8th Floor, Capital Plaza Tower; Frankfort, KY 40601; (502) 564-4970.

SHIPP: Severe Handicaps Integrated Preschool Programming

Project SHIPP is a comprehensive training project designed for teachers and other professionals currently providing services to children ages 0 to 5 years who have severe or multiple handicaps. It is a collaborative effort between the Office of Education for Exceptional Children (OEEC) and the Cabinet for Human Resources (CHR). The content focuses on developing and implementing integrated programs, which rely on embedding basic skill instruction within the context of age-appropriate functional activities and daily routines. Training is provided twice (fall and spring) each year for a total of 40 participants.

The 10 days of training consists of three modules spread out over three months. Modules cover normal development, family issues, integration strategies, basic skills (motor, hearing, vision, communication, behavior/social, self-care), medical issues, assessment, curriculum development, scheduling, and transdisciplinary teaming and integrating related services.

Three hours of graduate credit level are available for persons who complete the training. An administrator training session is also part of the SHIPP Project. Funds are available for participant expenses. School districts or other agencies who are interested in sending teachers and other school personnel should contact Jennifer Leatherby, Director at the Kentucky Deaf-Blind Intervention Project, University of Kentucky, Department of Special Education; 229 Taylor Education Bldg.; Lexington, KY 40506-0001; (606) 257-7909.